

Contact: Rachel Boon

**PROFESSIONAL DEVELOPMENT ASSIGNMENT REQUESTS FOR FY 2020**

**Action Requested:** Consider approval of the requests by the Regent universities for professional development assignments for FY 2020.

**Executive Summary:** Each year, the Board of Regents is asked to approve faculty professional development assignments as specified in Iowa Code §262.9(14) and Board Policy §2.2.R. For FY 2020, the universities request approval of 135 faculty professional development assignments. A brief description of the work planned for each proposed assignment is available below. This report addresses the Board of Regents Strategic Plan priorities for “promoting and supporting innovation in teaching, research, and economic development and promoting effective use of resources to meet institutional missions.” The Board office recommends approval of the professional development assignment requests for FY2020.

**NUMBER OF PDA RECIPIENTS AND PERCENT OF TOTAL FACULTY  
FY 2016 – FY 2020**

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>
SUI	56 (2.4%)	53 (2.3%)	65 (2.8%)	56 (2.4%)	71 (3.0%)
ISU	37 (2.0%)	31 (1.6%)	42 (2.1%)	43 (2.2%)	50 (2.7%)
UNI	17 (2.1%)	16 (2.0%)	15 (1.9%)	12 (1.7%)	14 (1.8%)
<b>REGENT TOTAL</b>	<b>110 (2.2%)</b>	<b>100 (2.0%)</b>	<b>122 (2.4%)</b>	<b>111 (2.2%)</b>	<b>135 (2.7%)</b>

**Background:**

Institutional policies. Each university has academic policies that describe the process and requirements for professional development assignments (PDA) and which guide the selection of faculty proposed for PDA.

- **University of Iowa.** Full-time faculty members (i.e., tenure or clinical-track) with nine-month appointments who have completed a minimum of 10 semesters of full-time academic service are eligible for an initial one-semester PDA. Twelve-month faculty members are eligible for their first PDA of one semester after they have completed a minimum of four years of full-time academic service or the equivalent (i.e., prorated for part-time faculty). Twelve-month faculty members who have completed eight to 11 years of full-time academic service or the equivalent (i.e., prorated for part-time faculty) are eligible for a PDA of two semesters or a full 12 months, respectively. To become eligible for a subsequent award following a PDA, faculty members with nine-month appointments must complete 10 semesters of full-time service; faculty members with 12-month appointments must complete four years of full-time service.
- **Iowa State University.** All members of the faculty employed half-time or more are eligible to apply for a PDA. There is no restriction on length of service to qualify; however, priority may be given to tenured faculty over adjunct and non-tenured faculty and to persons who have not received a PDA in the past five years.
- **University of Northern Iowa.** Policies and procedures relating to PDA at UNI are defined in the Faculty Handbook. A recipient of a PDA is ineligible for a subsequent assignment during the three years following an award.

Review process. The three universities conduct a rigorous review process for each proposed PDA. Peer review and recommendation are the basis of selection at the department and college levels at each university and final approval by the provost. Criteria considered include the impact of the proposed PDA on the institution and the state.

Length of assignments. Professional development assignments are usually for one semester, although they may be up to a year. For PDA that are two semesters in length, compensation is limited to the amount of compensation a faculty member would receive during a semester-long assignment. Salary savings generated from faculty members on assignment for a full year offset the replacement costs for other faculty members.

Obligation to institution. Iowa Code §262.9(14) requires that a faculty member return to the institution for twice the length of time of the professional development assignment or to repay the costs associated with the PDA if the faculty member does not return to the institution. Following a PDA, faculty members are responsible for reporting the results of their assignments as specified by Board Policy 2.1.4.R. and institutional guidelines.

Value of professional development assignments. The PDA provide increased visibility and prominence of faculty and departments in research and scholarship and direct application of expanded knowledge to students, Iowans, the nation, and the world. Recipients often compete successfully for external grants that benefit the professors, programs, the universities and the state by generating revenue for core university activities.

Proposed activities. Faculty members engage in a variety of productive activities during their PDA. For example, faculty members perform intensive research, write scholarly books and articles, create new works of art and composition, present papers, work in industry, prepare grant proposals, mentor graduate students, and develop modeling systems, software, course materials and multimedia resources for their discipline. PDA enrich the educational environment of the universities and are essential to the academic vitality of the universities.

Faculty replacement costs. Estimates of the replacement costs for faculty members who are on professional development assignment are below.

- At SUI, the total projected cost of the program for FY2020 is \$205,300. For the recommended awards, costs will be reduced, where possible, by having colleagues cover courses or deferring non-required courses to a later time.
- To the extent possible, ISU department chairs and deans provide flexible approaches to managing the workload and associated costs for the assignments, including reassignment or alternate scheduling of courses. Some PDA requests do not represent new costs because the department reassigns course load among current faculty. Salary savings generated from faculty members on assignment for a full year are used to offset the replacement costs for other faculty members. FY2020 costs, net of salary savings, are \$36,649 (\$397,950 in estimated costs minus \$361,301 in salary savings).
- At UNI, replacement funds are the responsibility of the colleges and departments of the PDA recipients; no central funds are provided. In some cases, departments may increase class size or curtail course offerings to cover the faculty members' reduced course load while on PDA. Some departments may hire adjuncts so that courses necessary for students' academic progress can be offered. The estimated costs for adjunct salaries and required benefits in these cases total approximately \$220,050.

**BUDGETED REPLACEMENT COSTS  
FY 2016 – FY 2020**

	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY2020</b>
SUI	\$173,280	\$136,668	\$201,851	\$211,256	\$205,300
ISU	\$144,120	\$145,386	\$191,815	\$116,045	\$36,649
UNI	\$170,000	\$187,000	\$191,808	\$255,000	\$220,050
<b>REGENT TOTAL</b>	<b>\$487,400</b>	<b>\$469,054</b>	<b>\$585,474</b>	<b>\$582,301</b>	<b>\$461,999</b>

**THE UNIVERSITY OF IOWA**

ARNDT, MATTHEW, Associate Professor, CLAS-Music, 7 years of service, fall semester  
Title: Elaboration in Georgian Chant

With this PDA, Professor Arndt will study the elaboration of simple musical patterns to produce complex ones in three-voiced sacred chant from the Republic of Georgia. Prof. Arndt aims to investigate the unity—posited by practitioners—of an ancient, simple manner of Georgian chant with two increasingly modern, elaborate manners. What specific forms of elaboration might render the latter two manners more elaborate and unified with the first? Prof. Arndt will extrapolate these forms of elaboration and their consequences for further study and practice, synthesizing (1) empirical data about melodic and harmonic tendencies in transcriptions of the three manners of chant, (2) interpretation of a manuscript containing the sole extant illustration by one of the original master chanters of relations between the three manners of chant, (3) experiential learning of style through attending a Georgian singing workshop with master musicians. Prof. Arndt anticipates that this study will result in a substantial article. This research will shed new theoretical and practical light on the treasury of Georgian chant, and it will contribute to his teaching and research on elaboration in Western music.

BEICHEL, REINHARD R, Associate Professor, Electrical and Computer Engineering, 12 years of service, fall semester

Title: Investigating Deep Learning Methods for Automated Medical Image Analysis

Deep learning is a recently introduced, advanced approach to implement machine learning. Prof. Beichel will investigate deep learning methods to solve commonly encountered problems in the automated analysis of medical images. The project is expected to result in several journal papers, provide the preliminary work required for National Institutes of Health grants, and enable students to study as well as apply deep learning methods. Prof. Beichel's project is expected to contribute to the advancement of quantitative medical image analysis methods, enabling precision medicine to improve healthcare.

BOND, SARAH E, Associate Professor, CLAS-Classics, 4 years of service, fall semester

Title: Providing Digital Humanities Resources and Workshops for Public Outreach

This PDA will be used to continue to develop the open-access resources within the digital humanities project called WOAHA: Women of Ancient History ([woah.lib.uiowa.edu](http://woah.lib.uiowa.edu)). After 3 years of development and growth to connect female ancient historians, the database will now be expanded for use by other underrepresented groups. While expanding the digital tools, we will also be designing, implementing, and then disseminating information on in-person workshops for women and underrepresented groups to learn how to write for a public audience. The first workshop will be at the Digital Scholarship & Publishing Studio at the University of Iowa in September of 2019, followed by one at Northwestern University in October 2019. This award is about further augmenting WOAHA to amplify the voices of women and people of color, and then providing the downloadable code, digital support, and the in-person training and networking for underrepresented groups that is needed to develop their own public projects. The award will benefit Professor Bond's classes for the Public Digital Humanities Certificate, her GIS mapping courses, and her course on the history of marginalization.

BROWN, MATTHEW P, Associate Professor, CLAS-English, 17 years of service, spring semester

Title: The Novel and the Blank: Thinking with the Print Shop in British America

Professor Brown will finish his second book—The Novel and the Blank: Thinking with the Print Shop in British America—and ready it for publication. He will also draft an article on Iris Murdoch's A Word Child, based on rare holdings at the UI. The monograph corrects notions of printing and literacy in early America, whereby a perceived rise in reading matter led to enlightenment and independence. Instead, book trades data shows steady output, not growth; and it shows two

spikes, the Great Awakening (1735-44) and the Revolution (1765-76). Alert to these two rhythms—of steadiness and surges—Brown illustrates how printers measured the market, adapted to constraints, and effected change. Readers took from this output ideas of the self based on contractualism, revivalism and consumerism. With chapter drafts done by Jan. 2020, Prof. Brown will revise the manuscript holistically during the PDA. His essay on Murdoch focuses on the materiality of writing and seeds a project derived from her handwritten drafts held here. The projects will inform his teaching at the undergraduate and graduate level, and they will benefit society by explaining the value of our paper-based cultural inheritance.

BUCH, ELANA D, Associate Professor, CLAS-Anthropology, 7 years of service, fall semester  
Title: Transforming Care on the American Prairie.

As younger adults migrate to urban centers seeking work, those remaining in rural communities are more likely to be older adults. Population aging creates unique challenges for rural communities, including reduced access to formal and family care. Dr. Buch's research will investigate how rural Iowans are adapting their ways of caring for one another and local landscapes in the face of rural aging and out-migration. This project will produce nuanced portrayals of the ways Iowans are creatively caring for one another during a time of significant social change using long-term, participatory research and life history interviews with older adults and their kin. This research advances the University of Iowa's strategic goal of enhancing engagement with Iowa communities, and will provide evidence to inform policymaking about needed supports for rural Iowan elders. Research findings will be incorporated into Dr. Buch's courses on Aging, Caregiving and Health, the Beginnings and Ends of Life, and Contemporary World Problems. The project is also expected to result in several journal publications and will provide pilot data to be used in external grant applications.

CARREL, MARGARET, Associate Professor, CLAS-Geographical and Sustainability Sciences, 7 years of service, spring semester  
Title: Spatiotemporal Patterns and Processes of Infectious Disease Outcomes in US Veterans, 2004-Present

Understanding where and why infectious disease outcomes, particularly drug resistant outcomes, take place is necessary to design public health interventions to decrease disease incidence. Working with data collected by the Veterans Health Administration on infectious disease outcomes in US veterans from 2004 through the present, Dr. Carrel will employ spatial statistical methods to determine where veterans are experiencing outcomes such as drug resistant *S. aureus* and then what in their residential or healthcare settings is influencing these patterns. The project will result in grant applications to the VHA and other federal funding agencies and in publications and presentations at research conferences. The methods and data used by Dr. Carrel will also improve the training of graduate students in health geography and will enhance the spatial health course offered by Dr. Carrel to undergraduate and graduate students. The findings will also improve understanding about spatiotemporal patterns of infectious disease outcomes in US veterans, who reside in every county in the US, and will indicate where there are opportunities for prevention or intervention in these outcomes.

CARRICA, PABLO, Professor, Engineering-Mechanical Engineering, 11 years of service, fall semester

Title: Improving Bubbly Flow Modeling and Simulation Capabilities for Naval Applications  
This proposed PDA aims at developing new bubbly modeling capabilities tuned for ship and submarine hydrodynamics flows, with focus on bubbly wakes and the resulting signature. The acoustic signature of a ship strongly depends on its bubbly wake, which can be characterized by measuring acoustic attenuation and/or scattering, enabling underwater detection. In addition, the bubbly wake shows in aerial surveillance as a characteristic signature of "white water". The team Professor Carrica has developed modeling and numerical tools to predict bubble entrainment and

transport that in naval flows result in bubbly wakes. In this PDA Prof. Carrica will work in collaboration with colleagues at Stanford University and MIT to improve and further develop the entrainment model developed by Prof. Carrica's team at The University of Iowa using simulations for fundamental flows performed at Stanford and MIT. The project will contribute to understand fundamental processes of bubble entrainment and also benefit the state of the art of models and the computational tools used by the US Navy for diagnosis of bubbly wake and signatures, and help procure funding to continue research in this area.

CHIFAN, IONUT, Associate Professor, CLAS-Mathematics, 6 years of service, fall semester  
Title: Prospectus for a Project on the Structure of Group Von Neumann Algebras  
Professor Chifan will continue to develop his 10-year-old research program in the study of von Neumann algebras. His goal is to identify new parameters that enable one to distinguish between these objects. In doing so he will explore new bridges between these algebras and important aspects in dynamics and group theory. His project is expected to advance significantly his research program; it will provide dissertation problems for his graduate students, whose employment depends upon cutting-edge research; and it will provide research opportunities for undergraduates designed to enhance their competitiveness for admission to prestigious graduate programs. Professor Chifan will continue to seek NSF funding which thus far has provided invaluable support for his graduate students.

CHIPARA, OCTAV, Associate Professor, CLAS-Computer Science, 7 years of service, fall semester  
Title: Software Adaptation Techniques for Internet-of-Things (IoT) Systems  
Wearable Internet-of-Things (IoT) devices, such as smart watches, smart glasses, and cloud-enabled hearing aids promise to improve our everyday lives. However, developing such systems is challenging. System developers must account for the differences in users and hardware platforms, and anticipate how a system will respond to the changing operating conditions. For example, a hearing aid may use its onboard processor to augment speech in relatively quiet surroundings but rely on more powerful cloud computing resources to enhance speech as users encounter more noisy environments. Today, developers lack effective programming languages and tools to help them create and improve such IoT systems. Dr. Chipara's project will focus on developing software synthesis techniques for such systems. The project will allow Dr. Chipara to focus on ongoing research grants and is expected to result in several publications and a grant application.

CHRISTENSEN, ALAN J, Professor, CLAS-Psychological and Brain Sciences, 25 years of service, spring semester  
Title: Behavioral Factors and Patient Outcomes in Cancer Survivors  
Professor Christensen will examine behavioral and psychosocial factors related to patient treatment adherence and quality of life among head and neck and breast cancer survivors during the Professional Development Assignment period. Cancer survival rates and the approach to cancer treatment has changed dramatically in recent years creating new opportunities for scientific investigation as well as for clinical practice. Work conducted during this award period will build on and extend Prof. Christensen's past research involving self-management in chronic disease to studies involving patients with head and neck and breast cancer. The work to be done in collaboration with colleagues at the University of Miami is expected to result in several peer reviewed journal articles and a grant submission to the National Cancer Institute, and provide material for the development of a new undergraduate and graduate course on the "psychology of cancer". The work will have significant implications for enhancing survivorship care planning and quality of life among cancer patients in the State of Iowa and beyond.

COOK, SUSAN W, Associate Professor, CLAS-Psychological and Brain Sciences, 10 years of service, half time for academic year

Title: Computational Modeling of Interaction in Educational Contexts

Our understanding of verbal communication has led to interactive conversational systems like Alexa, which have potential to improve education by delivering personalized instruction in real-time. Yet these systems lack an appreciation for nonverbal aspects of human communication. Professor Cook studies how nonverbal representations influence math learning. Prof. Cook will visit the Social Cognitive Systems group at the University of Bielefeld, in order to acquire skills in computational modeling and establish interdisciplinary research collaborations applying these skills to educational interactions. Bringing computational models of social interaction into educational interventions is expected to improve learning outcomes while also providing an important research tool for studying dynamic interaction with high fidelity. This work will lead to grant proposals, publications, and to unique training experiences for graduate and undergraduate students. Research findings and skills acquired will be incorporated into undergraduate and graduate teaching. Using our understanding of human communication to improve education will directly benefit students in the State of Iowa and beyond.

CRAMER, BRADLEY D, Associate Professor, CLAS-Earth and Environmental Sciences, 6 years of service, spring semester

Title: High-Resolution Event Stratigraphy of the Altajma Core, Gotland, Sweden

Professor Cramer will complete research on a drill core from the Swedish island of Gotland that was drilled and shipped to Iowa and currently stored in Trowbridge Hall. The rock record preserved in this core represents fifteen million years of Earth history spanning from ~440 Ma to 425 Ma (Ma=Million Years Ago) and was specifically drilled as part of his NSF CAREER grant to provide the highest resolution record ever developed for this interval of time known as the Silurian Period. The work on this core will include at least two graduate student theses and/or dissertations and will also be the centerpiece of manuscript publications for Prof. Cramer for 2020-2022. Understanding this interval of Earth history is important because there are large perturbations to the global carbon cycle, similar to what we are seeing today. There was little to no life on land during the Silurian however, which makes investigating and modeling the ocean-atmosphere feedbacks within the global carbon cycle much more straightforward. Insights gained about the integrated Earth System during this project will directly inform our working models of the modern ocean-atmosphere-biosphere Earth System.

CURTIUS, ANNY DOMINIQUE, Associate Professor, CLAS-French and Italian, 15 years of service, spring semester

Title: Unshackling the Memory of Slavery: the Ecodialectics of Landscape and Seascape Memorials

Professor Curtius' interdisciplinary project examines memorials grounded in landscape such as the Blue and John Crow Mountains in Jamaica, the Memorial ACTe in Guadeloupe, Le Morne in Mauritius in the Indian Ocean, The Ark of Return in New York City, and seascape such as the Cape110 Memorial in Martinique, and slave cemeteries excavated on beaches in Guadeloupe. These sites constitute loci of resistance, suffering, and community building and commemorate the transoceanic slave trade and slavery. Backed up by literary texts, she argues that while the monuments encapsulate a traumatic history, they also interrogate and challenge the traditional definition of memorials, museums, archives and literature. Her project was workshopped at the Obermann Center for Advanced Studies, and the subject of collaborative and public outreach initiatives at Iowa. Her teaching regularly features elements of this project, and she plans to offer a General Education Diversity and Inclusion course on Monuments, Memory, and the Diversity of Cultures. Her project will also contribute to the UI's international mission and educate the Iowa community about the relational dynamics between the Global South and the US.

DAVIDOVIC, JOVANA, Associate Professor, CLAS-Philosophy, 6 years of service, fall semester  
Title: Ethics of Autonomous Weapons Systems

Professor Davidovic will use her PDA to examine the ethics of autonomous weapons systems (AWS). Both critics and proponents of AWS focus on empirical data; they debate likelihood of malfunction, chances of interference, and whether AWS will minimize collateral harm in war. Prof. Davidovic will, in a series of papers, ask whether even perfectly functioning AWS are morally suspect. The first paper will focus on ethics. AWS should not be used because our right to life entitles us to certain protections, including being killed only in very particular circumstances and by particular actors. The second paper will focus on policy and legal questions. The third paper will present the ethical and legal argument in a popular format, hoping to reach a wider audience. Finally, Prof. Davidovic will start developing ethical principles for AWS. Governments around the world are assembling teams of experts to examine best principles for the use of AI. This project will help place her in a position where she can meaningfully contribute to such debates. This project will also help Prof. Davidovic in syllabi development for War, Terrorism and Torture, where she currently teaches about drones.

DILLEY, PAUL C, Associate Professor, CLAS-Religious Studies, 7 years of service, spring semester

Title: Biographies of Saints and Graeco-Roman Popular Theater: A Theory of Ancient Christian Comedy

Professor Dilley will pursue work on his monograph, "Biographies of Saints and Graeco-Roman Popular Theater: A Theory of Ancient Christian Comedy", as well as finish related digital humanities projects already underway, including the electronic first edition of the Life of Eupraxia, a 5th-century Greek biography of a young girl who becomes a nun by imitating and laughing at the other sisters. He has identified thirteen biographies of ancient monastic saints which draw on scenes from Graeco-Roman popular theater, which as a group represent a previously unnoticed therapeutic understanding of humor in early Christianity. This research will lead to an 80,000-word monograph, a digital edition of the Life, and several journal articles on digital humanities topics. He will discuss the results in his large undergraduate lectures, including "Judaism, Christianity and Islam", and "Big Ideas: Information, Society, and Culture"; and seek to communicate them with the broader public in Iowa and beyond, by building on previous coverage of his research in both national (New York Times, Newsweek) and local (Iowa Public Radio) media.

EKDALE, BRIAN R, Associate Professor, CLAS-Journalism & Mass Communication, 7 years of service, spring semester

Title: Digital Work in Kenya's Media Industries

Professor Ekdale will study digital work in Kenya to better understand the relationship between the gig economy and the country's jua kali sector, Kenya's well established informal economy known for worker ingenuity and self-reliance. The many similarities between jua kali culture and the gig economy indicate that a comprehensive study of Kenya's media industries will provide valuable lessons for understanding the changing nature of digital work in the U.S. This study will be based on interviews with media professionals in Nairobi, Kenya and will result in a book manuscript written for an academic audience interested in digital media and labor in the media industries. Prof. Ekdale will incorporate lessons learned from this project into teaching Social Media Today and Digital Cultures at the University of Iowa. He will also design a new course about the global gig economy. As more and more American media professionals rely on hustling and self-entrepreneurship to earn a living, a study of Kenya's jua kali culture will offer insights into the challenges and opportunities of the gig economy in the U.S. and elsewhere.

FAGAN, SARAH, Professor, CLAS-German, 24 years of service, fall semester

Title: "Moving forward": from Euphemism to Discourse Marker

The buzz phrase "moving forward," uttered by everyone from politicians to local weather forecasters, is not simply a superfluous, meaningless phrase. It functions as a discourse marker, an expression (like "after all," "however," and "I mean") which is used to indicate how one piece of discourse is connected to another. Professor Fagan's project is a corpus-based study to document the pathway of change in the historical development of "moving forward," from its emergence as a euphemism to its use as a marker of a boundary in discourse (e.g., as a signal of a new topic). The study will contribute to our understanding of the role of discourse markers in the organization of spoken and written texts as well as provide insights into language change. The project is expected to result in several conference presentations and journal articles. Prof. Fagan will involve undergraduate and/or graduate students in the project, who will learn methods of corpus linguistics, undertake linguistic analysis, and have the opportunity to contribute to the resulting conference presentations and journal articles.

FIGDOR, CARRIE, Associate Professor, CLAS-Philosophy, 11 years of service, half time for academic year

Title: Psychology in Transition and its Moral, Social, and Theoretical Implications

Professor Figdor's main research examines our changing understanding of psychology in the light of discoveries of psychological capacities (e.g., decision-making, assessing evidence) throughout the living world, from birds and octopi to slime molds, insects, bacteria, and plants. Her PDA project will explore implications of this conceptual change, including reassessing the traditional links between psychological capacities and moral and social categories, and critically assessing standard approaches to the integration of psychology and neuroscience. Prof. Figdor will develop ties with interdisciplinary researchers at University of Sydney and other institutions. Outcomes include publications by Prof. Figdor (single-authored and collaborative) and a major grant proposal. She will develop an advanced course on diverse minds and start a reading group on theoretical issues in psychology. These contributions will be enhanced by her recent secondary appointment in the Department of Psychological and Brain Sciences and her participation in the interdisciplinary Neuroscience major.

FINAMORE, JOHN F, Professor, CLAS-Classics, 35 years of service, half time for academic year

Title: Translation of Proclus's Commentary on Plato's Republic

Professor Finamore will be the principal investigator creating a translation with notes of the Greek text of the 5th Century A.D. philosopher Proclus's commentary to Plato's Republic. The Republic is Plato's most important and influential work, and Proclus's commentary is the only extant commentary from the ancient Greek world on it. As such, it is a valuable resource for understanding how philosophers 800 years after Plato interpreted and understood this work. The commentary has never before been translated into English. Prof. Finamore, a specialist in ancient Greek philosophy, is collaborating with Profs. Baltzly and Miles of the University of Tasmania to publish the translations in three volumes with Cambridge University Press. Prof. Finamore regularly teaches courses on ancient philosophy, which this project will enhance. This first English translation of Proclus's commentary will generate new and exciting international research on Proclus and thereby bring international recognition to the University of Iowa.

FINZEL, EMILY, Associate Professor, CLAS-Earth and Environmental Sciences, 6 years of service, fall semester

Title: Prospectus: Fingerprinting an Ancient Fluvial-to-Marine Transition Zone in the Stratigraphic Record Using Geochemical Approaches

Professor Finzel will develop a novel method for acquiring geochemical data and applying geochemical proxies to interpret coastal transition zones in the ancient rock record. Where a coastal river meets the ocean is one of the most complex environments on earth because of the

dynamic intermingling among terrestrial and marine sediment logic, biologic, and environmental processes. Coastal regions are where the effects of global warming on sea level are focused, so understanding the record of this transition would have implications for coastal and wetland sedimentary and biotic evolution in response to climate change. Furthermore, ancient coastal deposits host many prolific hydrocarbon reserves, including one of the largest in the world, the McMurray Oil Sands in Canada. Results from this project would significantly aid in evaluating hydrocarbon reservoirs that occur in these types of deposits. This project is expected to result in at least two journal articles, pilot data to facilitate a grant proposal to the National Science Foundation, opportunity to foster a new collaboration with an industry partner, and new material for Professor Finzel's undergraduate and graduate courses.

**GALVIN, JAMES A**, Professor, CLAS-Creative Writing, 34 years of service, fall semester

Title: James Galvin New and Selected Poems

Professor Galvin published his eighth book of poems (his 10th book overall) in August of 2016. That book received some fine reviews, and Prof. Galvin read from it in venues coast to coast. Prof. Galvin plans to use his PDA in the fall of 2019 to work on a "New and Selected" volume of poetry. This will involve writing new poems that are good enough to stand next to the best poems Prof. Galvin has written in his career since 1975. It will also involve trying to determine which are the indispensable poems. Whether or not Prof. Galvin's "New and Selected" will have a major impact on American poetry, thus benefiting the University of Iowa, the State of Iowa, and the state of American Poetry, will depend on superior writing and editorial acumen.

**GOODMAN, SHAWN S**, Associate Professor, CLAS-Communication Sciences & Disorders, 12 years of service, fall semester

Title: Identifying Precise Locations of Physiological Damage in the Auditory System

In the area of hearing loss and deafness, there are several recent, exciting developments related to targeted drug delivery and gene therapy. While these potential treatments hold promise for restoring normal hearing, one current limitation is in understanding how the results of hearing tests can be used to indicate specific locations for targeted therapy. Prof. Goodman's work will provide targets that are more precise, by elucidating where within the auditory system different hearing test results are generated. The project will apply a newly developed technique for testing the cochlea and auditory nerve. This new technique allows more precise measurements than were available previously. Providing a better understanding of the relationship between hearing test results and the underlying physiological mechanisms of hearing will accelerate progress towards successfully regenerating damaged parts of the human auditory system. Work completed during the PDA is expected to result in published journal articles, an R01 grant from the National Institutes of Health, and new material for Prof. Goodman's Auditory Anatomy and Physiology course.

**GORDON, JEAN K**, Associate Professor, CLAS-Communication Sciences & Disorders, 17 years of service, fall semester

Title: Facilitating Fluency in Aphasia

In language disorders caused by stroke, one of the most common and frustrating impairments is a disruption in fluency. In some individuals with aphasia, speech production becomes halting and effortful, with frequent pauses while the speaker searches for words or struggles to formulate a sentence. In others, speech remains fluent, but may be full of errors. This contrast gives rise to a widely used but poorly understood diagnostic distinction (fluent vs nonfluent aphasia) that is important for both speech-language therapy and research. However, the measurement of fluency in aphasia is notoriously variable and unreliable. Prof. Gordon is currently conducting a funded study to examine the factors underlying fluency ratings and their reliability, and to develop a new method of measuring fluency. During the PDA, Prof. Gordon proposes to validate the new test with practicing clinicians and to write a grant proposal for federal funding to assess the therapeutic

implications of the findings. Results will contribute directly to teaching and clinical care by clarifying how fluency can be reliably measured and how this can guide therapy.

GRUCA, THOMAS S, Professor, Business-Marketing, 27 years of service, fall semester

Title: Individual Trader Behavior in Media-Focused Prediction Markets

Iowa is a pioneer in media-focused prediction markets, offering the first real-money box office prediction market in 1995. While past research focuses on the accuracy of prediction markets, few studies leverage individual trader data to test key theories in financial decision-making. A unique feature of the IEM Movie Markets is that many traders provide a forecast of the movie's success before the markets open for trading. Professor Gruca will be using data from the IEM Move Markets to examine how a trader's prior information affects various market behaviors and outcomes. Studies will examine how a trader's forecast, trading activity and gender affect portfolio holdings and returns. These studies will provide insights into potential biases and other issues that may affect an investor's returns. This is an important issue as more and more workers are responsible for their own investing decisions due to their participation in defined contribution retirement plans.

HAES, AMANDA J, Associate Professor, CLAS-Chemistry, 12 years of service, spring semester

Title: Enabling Nanotechnology Development for Public Health and Safety

Professor Haes will apply and expand her expertise in nanomaterials and spectroscopy to improve the rapid detection of heavy metals and drugs of abuse including opioids. Her goals will focus on developing sampling and detection protocols for both samples that could be used by first responders; establishing collaborators in materials, engineering, and public health and safety; and submitting proposals to the Departments of Defense and Justice as well as the National Institutes of Health. This effort will benefit students at the University of Iowa by providing highly relevant research support and opportunities. Methods that quickly detect new drugs/formulations will improve public and individual safety and hopefully, save lives through the development of enabling technology. Similarly, heavy metal leaching from natural soils after acid rain events is hypothesized to correlate to an increase in ER visits. This enabling technology will identify heavy metal speciation in water so that correlations can be confirmed/refuted. As a result, this PDA centers on the development of sampling and detection of these molecules thus benefiting all citizens.

HAN, WEIMIN, Professor, CLAS-Mathematics, 27 years of service, fall semester

Title: Numerical Analysis of Time-dependent Hemivariational Inequalities with Applications in Contact Mechanics

Hemivariational inequalities (HVIs) are highly challenging mathematical problems with important applications in mechanics and engineering. Due to the nonsmoothness and nonconvexity of the problems, it is very difficult to develop and analyze efficient numerical methods. Prof. Han has done pioneering and systematic work for the numerical analysis of time-independent HVIs. In this project, he will develop a comprehensive mathematical theory for the numerical solution of time-dependent HVIs and apply the theoretical results in the numerical solution of time-dependent HVIs. New techniques will be developed for the numerical studies of time-dependent HVIs. The results from the project will be published in four or more journal papers, be incorporated in a planned book on the numerical solution of HVIs with applications, be used in proposals for external funding, and become part of course materials.

HEIMER, KAREN, Professor, CLAS-Sociology, 27 years of service, half time for calendar year

Title: Gender, Race, Crime and Justice: Studies of Violent Victimization and Incarceration

This PDA will support Professor Heimer to work on two projects. The first is the writing of a book on violence against women and people of color in the United States. The book will report on a series of statistical analyses based on a unique data file that Prof. Heimer and her colleagues

have created, which pools data drawn from 44 years of interviews by the National Crime Victimization Survey (roughly 14 million records, 1973-2017). The data file that Prof. Heimer and colleagues have built is unique and allows for the assessment of how risks of violence have changed over time for women and minorities, and what factors are associated with this change. The second project supported by the PDA will be a quantitative data collection and analysis of imprisonment rates of women, men, and minorities in the United Kingdom. The findings will be compared with data that Prof. Heimer has compiled and analyzed for the United States. The second project will be the basis for several journal articles and conference presentations. The PDA work will augment Heimer's teaching of courses on crime, violence and justice. The findings will also speak to policy in the respective areas of research.

HOENICKE-MOORE, MICHAELA, Associate Professor, CLAS-History, 11 years of service, spring semester

Title: The Varieties of Patriotism: Americans Debate Their Country's Role in the World From the 'Good War' to Vietnam

Over the course of her PDA, Prof. Hoenicke-Moore will complete archival research and write up the findings for a study entitled 'The Varieties of American Patriotism,' which examines foreign policy views at the grassroots level. The findings to date show that American citizens vigorously participated in foreign policy debates from 1938 through 1975 to a much larger extent than previously recognized. Based primarily on thousands of citizen letters to elected officials, private communications, and oral histories, the project is the first one to ask how ordinary Americans experienced their country's globalism and how their views compare to those of foreign policy experts. The work carried out during the spring of 2020 will result in a monograph, in several journal articles and in additional public talks. It will yield new source material and insights for undergraduate and graduate courses, documenting how citizens of Iowa and the country in general expressed their views on the need, expediency or futility of fighting overseas and articulated their own conceptions of 'what America is all about.'

JORGENSEN, PALLE E, Professor, CLAS-Mathematics, 35 years of service, spring semester

Title: Networks, Stochastic Models, Machine Learning, and Financial Mathematics.

Professor Jorgensen's PDA is focused on three interdisciplinary areas: (i) Machine learning/uncertainty quantification, (ii) large networks, and (iii) Ito calculus/ financial derivatives. Via Prof. Jorgensen's teaching innovations, his mentoring, and his interdisciplinary research collaborations, there are projected direct benefits to students, to the University, and to two main industries in Iowa. Jorgensen already published in the area, and he has current active collaborations with multiple departments. PDA-objectives: (a) use of learning algorithms in design of effective tools for optimizing detection of features, and devising algorithms that combine deterministic and stochastic features, likely to yield better predictions. Successful models will produce reliable and repeatable results, uncover hidden insights and will be aimed at diverse groups of users; (b) design of hierarchical multi-scale algorithms in deep learning (DL). DL-algorithms, as opposed to task-specific algorithms, use representations of information-processing and communication patterns as seen in biological nervous systems and in neural coding.

JUST, CRAIG L, Associate Professor, Civil-Environmental Engineering, 7 years of service, fall semester

Title: Water, Sanitation, and Hygiene Interventions for Health Improvement in Resource-constrained Communities

Professor Just's PDA will focus on water, sanitation and hygiene (WASH) interventions aimed at improving public health in resource-constrained communities in India, Nicaragua, and other countries. The PDA will leverage recent funding from the U.S.-India Education Foundation to build educational and research capacity between IIT Roorkee (India) and the Sustainable Water Development graduate program at the University of Iowa. This PDA will also cultivate existing

relations with the Sehgal Foundation in India and with EOS International in Nicaragua who work directly with partner communities faced with WASH challenges. Prof. Just will also work with Prof. Jenna Davis at Stanford University to jointly research the impacts of various WASH interventions. Prof. Just will also work extensively with UI assistant professor, Prof. Kelly Baker to co-advise student research and write joint research proposals. Prof. Just's PDA will benefit students enrolled in his Community-Centered Problem-Solving & Design course and will contribute to the PhD research of his student advisees.

KITCHEN, ANDREW, Associate Professor, CLAS-Anthropology, 6 years of service, spring semester

Title: Critical Examination of the Timescale and Emergence of Pathogens in Human History  
Infectious agents, such as bacteria, viruses, and parasites, have been a source of mortality in humans since the origin of our species. The types and species of agents that have infected humans has changed through time as humans evolved and adopted new behaviors, such as agriculture, urbanization, and modern global travel. Prof. Kitchen will examine the timescale over which pathogens emerge using genomic data from bacteria, viruses, and humans. The project will reveal the complex history of *Mycobacterium tuberculosis*, the bacterial agent that causes tuberculosis disease, in relation to events in human history, and help us understand how shifts in human behavior may influence the emergence of infectious disease in the future. This project is expected to produce journal articles, a proposal to the National Science Foundation to support Professor Kitchen in future investigations of the origins of RNA virus infections in humans, and provide undergraduate course material and mentoring opportunities for students.

KRUGER, MARIE, Associate Professor, CLAS-English, 13 years of service, spring semester

Title: From Historical Trauma to Dark Tourism: Constitution Hill in the Popular South African Imagination

Professor Kruger will conduct research in South Africa for a new project on popular South African media representations of Constitution Hill, a historically significant trauma site in Johannesburg. Focused on a TV prison drama and an independent film, her project offers significant new insights into the strategic deployment of collective trauma in popular media: to advocate for social and environmental justice but also to commodify the past for entertainment. Based on original field work, Prof. Kruger will produce two scholarly articles, collaborate with the filmmakers on a new press kit, and participate in research projects with the University of Montpellier and the University of the Witwatersrand. She will use her multi-media research archive to design two new courses that help students acquire globally-oriented skills. Prof. Kruger will also finalize the production of her second book on the contributions of women to the anti-apartheid struggle and submit the entire manuscript to Routledge UP by February 2020. The book will consolidate her international reputation as a trauma scholar and provide Iowa residents with new understandings of women as political activists.

LANG, JOSEPH B, Professor, CLAS-Statistics & Actuarial Science, 26 years of service, spring semester

Title: Fiducial Statistical Learning without Pre-Data Information

Professor Lang's project is concerned with statistical learning, which plays an important role in machine learning, artificial intelligence, and in data-driven decision making more generally. The primary goal of statistical learning is to use data to reduce uncertainty about processes and their future outcomes; or loosely, to estimate and predict. Prof. Lang's work sets out to develop, clarify, and motivate the foundational concepts required to more broadly apply a little known and underutilized Fiducial statistical learning approach, which has important advantages over two mainstream approaches, Bayesian and Frequentist. In particular, his research will show that the Fiducial approach can lead to intuitive, direct measures of uncertainty that do not require the incorporation of pre-data assumptions. Tangible products from this project will include scholarly

articles, publicly-available computer software, and conference presentations. The research findings will fit neatly into the curriculum of several courses that Prof. Lang teaches. Students, policy makers, and anyone who makes data-driven decisions will benefit from Professor Lang's research on statistical learning.

LEDDY, JOHNA, Associate Professor, CLAS-Chemistry, 27 years of service, fall semester

Title: The Spin in Catalysis

Professor Leddy and her students have demonstrated that micromagnets on electrodes increase power and energy by 40% in electrochemical energy systems that include batteries, solar cells and fuel cells. They have demonstrated magnetic enhancements in electron transfer rates in a wide variety of reactions by putting micromagnets on electrode surfaces. However, the effects of electron spin on electron transfer rates are not well known and no theory is available. A fundamental model for how magnetic fields and gradients catalyze reactions is an important model will enable better designs for a wide variety of technologies and catalysts. The model advances the fundamental understanding that builds advanced technologies. Prof. Leddy will develop the model for how magnetic fields and electron spins interact to increase reaction rates. She will also write papers to promote this unique Iowa-based research. The project introduces students to new ideas and novel research and ideas like the worldwide impact if every battery were made 40% more efficient.

LEDOLTER, JOHANNES, Professor, Business-Management Sciences, 40 years of service, half time for academic year

Title: The Statistical Analysis of Textual Information

Historically the statistical analysis of information has dealt with numbers. Economists look at previous unemployment rates, investigate their associations with economic indicators, and predict their future. Scientists measure how experimental units respond to different treatments and assess whether average responses differ across groups. These inquiries are important for advancing scientific understanding. However much of today's information is in the form of text. The goal of the PDA is to write a book on the statistical analysis of text data. The book will include a rigorous discussion of statistical procedures that have proved useful for the analysis of text data and will include case studies that illustrate how to implement the proposed methods in practice. A study on the textual modeling of the Territorial Papers of the United States will address the data preparation, the visualization of text information, the fitting of formal models, and the analysis and interpretation of the results.

LIE, ERIK, Professor, Business-Finance, 14 years of service, spring semester

Title: Do Firms Grant Stock Options to Retain Their Employees?

Firms often grant stock options to its employees. Each of these stock options gives the right to buy one of the company's shares at a pre-specified price and within a certain period. The purpose of this study is to examine whether firms grant stock options to employees in an effort to prevent those employees from leaving to rival firms. To do so, the study will exploit the staggered adoptions by state courts of a doctrine that makes it more difficult for employees to leave to rival firms if they possess trade secrets. If firms indeed grant stock options to retain employees, the use of option grants should decline subsequent to the adoptions of the doctrine. Furthermore, the decline should be most prominent among firms with many trade secrets. The project entails collecting data, analyzing results, and writing a paper that is publishable in a top-tier finance journal. The objective of the study is to provide a better understanding for why firms grant options and help firms in Iowa and elsewhere make better decisions with regard to option grants to their employees. Students at the University of Iowa should also find this to be valuable as they prepare for their business careers.

LOGSDON, JOHN, Associate Professor, CLAS-Biology, 15 years of service, fall semester  
Title: Ancient DNA & Paleogenomics of Pleistocene Fauna from Natural Trap Cave  
Professor Logsdon will spend a semester conducting research in the Paleogenomics Laboratory of Dr. Beth Shapiro at UC Santa Cruz. During this time, Prof. Logsdon will learn and apply state-of-the-art methods for the isolation and analysis of ancient DNA. Specifically, Prof. Logsdon will isolate ancient DNA from a wide variety of small mammal fossils that have been recently obtained from excavations at Natural Trap Cave, Wyoming. Fossil specimens will be provided by Dr. Julie Meachen at Des Moines University with whom Prof. Logsdon will also collaborate on this project. Using these specimens, he will generate complete genome sequences—"paleogenomes"—from multiple species and compare these data with a parallel analysis of their morphology. The project is expected to result in multiple scientific papers, likely of high impact; however, the main outcome will be the ability for Prof. Logsdon to pursue a new direction in research to an expanding area in which only few labs in the US are competent. This newly-gained expertise will result in new projects and associated applications for external funding for Prof. Logsdon's lab, which will provide novel opportunities for student training at the UI.

MACKEY, MICHAEL A, Associate Professor, Biomedical Engineering, 18 years of service, fall semester

Title: Software Tools For The Course Systems Biology for Biomedical Engineers, BME:5435  
Systems Biology is a discipline that merges mathematical modeling with cell biology and shows promise for improvements in the understanding and treatment of many human diseases. The Cellular Engineering curriculum in Biomedical Engineering at Iowa has a tradition of being a leader in Biomedical Engineering education, and students in this program will certainly benefit from new coursework in Systems Biology under development by Prof. Mackey. The proposed PDA will provide for the development of a software component for a new Systems Biology textbook by Prof. Mackey. This work will merge biophysical approaches to modeling biochemical reaction networks with network theory to provide a novel teaching methodology for advanced undergraduate and graduate students at the University of Iowa. At this time, there is no similar methodology available and this work will be a significant contribution to the academic community, keeping Iowa at the forefront of Biomedical Engineering education.

MALKOVA, ANNA, Associate Professor, CLAS-Biology, 5 years of service, fall semester

Title: The Structure and Function of the Molecular Intermediates of Break-Induced Replication  
Maintaining genetic stability is important for the survival of cells and organisms. Double-strand DNA breaks (DSBs) are the most lethal DNA lesions threatening genomic stability, and cells have evolved a variety of mechanisms for their repair. Break-induced replication (BIR) is a "risky" pathway that can repair DSBs, but also often leads to mutations and chromosome rearrangements that are similar to those leading to cancer in humans. This makes it important to understand how BIR is regulated. The proposed research will use electron microscopy (EM) to determine the structure of BIR molecular intermediates, and will employ single-molecule assays to determine how Srs2 helicase regulates BIR progression. The obtained results will be published in high-impact peer-reviewed scientific journals and constitute preliminary data for a grant proposal to be submitted to NIH. Students at the UI will also benefit from Prof. Malkova's PDA, because the newly obtained knowledge will be incorporated into undergraduate courses she teaches and will enhance the research of graduate students. Together, this will increase the prestige of the UI, which will positively impact the state of Iowa.

MARTIN-ESTUDILLO, LUIS, Associate Professor, CLAS-Spanish and Portuguese, 13 years of service, fall semester

Title: Francisco de Goya and the Mystery of Reading

Some of Francisco de Goya's most influential artworks show very different types of readers—from aristocrats to animals—whose attitudes toward texts are often perplexing for spectators

today. Prof. Martín-Estudillo's project seeks to provide a historically and theoretically informed interpretation of these reading scenes, which appeared at a critical juncture in the development of Western culture. During Goya's lifetime (1746-1828) the mutation from "intensive" to "extensive" reading practices stirred intense debates which the Spanish artist engaged creatively. His works indicate that his interest in reading went well beyond a mere recognition of the increasing social relevance of this phenomenon. This study draws on contributions from several disciplines (including philosophy, art history, literary studies, and history of medicine) to construct a valid interpretation of this portion of Goya's production. It will also improve our understanding of how the way we encounter written and visual texts has developed since then. The findings obtained during the PDA will become part of the undergraduate course on Spanish Visual Culture and shared in a scholarly book.

MASON, SARA E, Associate Professor, CLAS-Chemistry, 8 years of service, spring semester  
Title: In Silico Sustainable Materials Discovery Guided by Density Functional Theory and Machine Learning

In this PDA proposal, details are given for how database mining, electronic structure calculations, and machine learning techniques will be combined to discover new functional materials from known structure types. Expected outcomes include research results for dissemination in peer-reviewed journals and expansion of the modeling expertise of Professor Mason (in which she will then train her research group members). Prof. Mason teaches advances undergraduate and graduate courses in physical chemistry, in which both the concepts of materials science and the tools of computational modeling from the PDA will be incorporated. A unique aspect of the proposed work is that Prof. Mason will apply her expertise in sustainability to target materials that are "benign by design." That is, as opposed to optimizing material function alone, Prof. Mason will work to develop design rules and chemical principles for materials that have a reduced negative impact on human health and the environment, and thus benefiting society in general.

MAURY, WENDY, Professor, Medicine-Microbiology, 19 years of service, other (May-October 2019)

Title: Defining the Phenotype of Macrophages that are Permissive for Ebola Virus Entry  
Identifying cells that are early targets of virus infection may allow us to specifically design blockade strategies to prevent infection. While tissue macrophages and dendritic cells are known to be the first cells infected with Ebola virus, a variety of subsets of these cells exist within the body; the specific cell population that is most permissive and likely to be the initial viral target is not known. This project proposes to use single-cell mass cytometry (CyTOF) to identify and phenotypically characterize this cell population. The UI does not have a CyTOF, but a collaborator, Prof. James Lorens, at the University of Bergen in Bergen, Norway does. Prof. Maury proposes to use the Bergen facilities to perform these studies over the summer months of 2019 (mid-May through mid-September). Additionally during this period, Prof. Maury will learn the software used to analyze large CyTOF datasets. Discussion of purchase of both a CyTOF and the software package at Iowa is ongoing, so through this opportunity, Prof. Maury can bring new skills back to Iowa to teach others in the Carver College of Medicine. Finally, Prof. Maury's teaching responsibilities will not be affected by this PDA.

MENTZER, RAYMOND A, Professor, CLAS-Religious Studies, 17 years of service, spring semester

Title: Training and Disciplining Protestant Pastors in Early Modern France

As events of the 21st century have painfully shown, pastors can and do behave badly. It is hardly surprising then to discover that pastors in earlier periods were not without their faults. Those serving the Reformed Churches of France during the seventeenth century offer an illuminating example. They were occasionally removed from their positions and transferred elsewhere because of moral shortcomings. Indeed, strict disciplinary oversight began already when the

future pastors were training for their vocation. The survival of a 17th-century register of the deliberations of the governors of the Academy of Saumur, the most famous of the French Protestant theology schools, presents an unparalleled opportunity to scrutinize misbehavior among theology students and the manner in which they were disciplined. The goal of the PDA is to write a substantial journal article on the subject. The project will also contribute significantly to Prof. Mentzer's courses on the History of Christianity and, accordingly, help students to understand and appreciate the historical roots and complexities of contemporary religious concerns.

MOORE, CATHLEEN M, Professor, CLAS-Psychological and Brain Sciences, 11 years of service, spring semester

Title: Applications of Neuroimaging to Post-Sensory Visual Information Processing

This career development period will be used to gain experience in the use of functional MRI (fMRI) methods as applied to questions of post-sensory visual processes, the substantive focus of Professor Moore's lab. We have studied these processes for years using psychophysical techniques, which involve the presentation of visual stimuli and the measurement of behavioral responses to draw inferences about visual mechanisms. Developments in the field of neuroimaging, especially fMRI, are such that more than simply understanding which parts of the brain are active during a given visual task, hypotheses about mechanisms of information processing (representational transformation) can be tested. Whereas students in this field a decade ago or so would have focused entirely on behavioral measures, increasingly, the use of neural measures can enhance and broaden their work. Prof. Moore will use this development period to add these methods to those currently in use in the lab, both in order to move the lab's research program forward, and to be able to provide students with the training that they need to be competitive in the field.

MOORE, DANIEL, Professor, CLAS-Music, 21 years of service, spring semester

Title: Collector's Items: A Sculpture in Sound

Collector's items are defined as items whose rarity or excellence makes them especially worthy of collecting. For the past twenty years, Professor Moore has collected music, instruments, and sounds from throughout the world. His ongoing creative work in music recording, technology, and composition will come together to create an audiophile-quality collaborative recording that recombines these collector's items with new performances created by himself and some of the world's top percussionists. This new project builds upon Prof. Moore's reputation in the field of music technology and recording as well as his previous PDA (development of the MIDI-marimba, 2004) along with previous grants from the Arts and Humanities Initiative, The School of Music, and the Music Industry. Prof. Moore intends to produce a potentially landmark recording that will bring recognition to the University and State through the recording's publication and professional review.

NIKOLAS, MOLLY A, Associate Professor, CLAS-Psychological and Brain Sciences, 7 years of service, spring semester

Title: Impact of Digital Media Use on Adolescent Mental Health

Engagement with digital media is playing an increasingly important role in child and adolescent development. While engagement with technology may help promote healthy behaviors, there is substantial evidence that frequent digital media use is having a negative impact on youth mental health. However, little is known regarding the mechanisms that may link frequent engagement with digital media to psychological difficulties. Prof. Nikolas's study seeks to identify the neural, cognitive, and emotional processes that may be impacted by frequent digital media use among adolescents. This work will utilize innovative technologies to measure dynamic interactions with digital media and its subsequent effects on youth mood and behavior in real time. These results will be critical to informing the development of prevention and intervention strategies aimed at

reducing the negative impact of digital media engagement on mental health and brain development. This project is also expected to result in a high-impact meta-analytic review article, a grant from the National Institute of Mental Health, and new material for Prof. Nikolas's undergraduate and graduate courses.

OSBORN, TRACY, Associate Professor, CLAS-Political Science, 11 years of service, spring semester

Title: Increasing Women's Representation? Women Candidate Groups in the U.S.

Professor Osborn will complete her book manuscript. Women candidate groups recruit, train and fund women candidates for elective positions. The book manuscript examines whether these groups succeed in electing more women to public office, whether these groups recruit both Democratic and Republican women, and whether groups have enough funding to sustain their activities long-term. Prof. Osborn teaches courses on Women and Politics and encourages undergraduate students to serve as her research assistants.

PHILLIPS, DAMANI C, Associate Professor, CLAS-Music, 5 years of service, spring semester

Title: Incorporating Iconic Global Folk Dance Music into Jazz

Professor Phillips plans to travel to four international destinations that are home to iconic folk dance/music styles recognized for their strong cultural identity and distinctiveness worldwide. Prof. Phillips will spend 4-5 weeks in each location to study the selected dance/music styles closely as they occur among the people from which the dance and related music originates. Data collection will occur in three ways: 1) direct observation of musicians/dancers participating in performances, 2) Artistic/Intellectual partnership with expert musicians/academics/dancers in the style of dance/music being studied, and 3) Participation in the music and/or dance being studied. At the end of each study period, 3-4 weeks will be spent here in the United States to compose 2-3 original compositions which meld the musical understanding gained during these exchanges with jazz music. The project will culminate in the creation of a new, nationally-released jazz album of original music inspired by dances (and related music) from around the globe. The time spent abroad will enable Prof. Phillips to create of a slate of compositions that embody an experiential comprehension of the music's source culture.

PRAHLAD, VEENA, Associate Professor, CLAS-Biology, 6 years of service, fall semester

Title: Calcium Imaging of Neuronal Activity in *C. Elegans*

Professor Prahlad will utilize a PDA to gain expertise in using calcium imaging techniques to assess neuronal activity, and disseminate these techniques to her research group. Prof. Prahlad uses the model organism *Caenorhabditis elegans* to investigate how neurons control gene expression changes that are protective in diseases like Alzheimer's disease and Parkinson's disease. Her studies have led to high profile publications and are funded by three federal NIH grants. However, future investigations will require a more dynamic understanding of neuronal activity as it relates to changes in an animal's behavior and gene expression. This can be achieved by using genetically encoded optical probes of neuronal activity and simultaneously recordings neuronal activity and gene expression changes. Acquiring the expertise to use this technology will enable new data acquisition for publications and grant proposals, open up exciting new opportunities for undergraduate research, and benefit the Iowa community by providing employment opportunities to existing Iowa scientists.

QIAN, HAIFENG, Associate Professor, Urban & Regional Planning, 4 years of service, spring semester

Title: Inequality in U.S. Cities: The Roles of Entrepreneurship and Labor Market Skills

There has been increasing income inequality in the United States over the past four decades, creating barriers to sustainable economic development. Professor Haifeng Qian's project seeks to explain why some U.S. cities have higher levels of income inequality than others. In particular,

he will examine whether and how entrepreneurial activity and labor market skills impact income inequality in cities. The findings will be integrated in his graduate courses taught at the UI, including Economics for Policy Analysis and Economic Development Policy. The results also inform Iowa policy makers at the regional or local level on how to tackle the income inequality problem in their cities.

RAHMATALLA, SALAM F, Professor, Civil-Environmental Engineering, 11 years of service, spring semester

Title: A Book titled: Discomfort in Whole-body Vibration

Professor Rahmatalla will write a book about discomfort in whole-body vibration. The book will be an important reference for people in industry and the military, where humans are subjected to severe random motions that can generate discomfort and potential injuries. Additionally, people in public health and emergency medicine will welcome such a book as it will provide them with important information in one package, rather than requiring them to read many articles from different sources. The book will also be a reference for students in biomechanics, mechanical engineering, ergonomics, public health and human factors. Prof. Rahmatalla has published many papers on this topic and has supervised several graduate students working toward their PhD and MS degrees. Prof. Rahmatalla has also been the PI and Co-PI of many projects in this area supported by the industry and the military. As such, Prof. Rahmatalla has accumulated a significant amount of knowledge and has written a number of reports, articles, and presentations that provide the right recipe for a new book in this area.

RAND, JACKI T, Associate Professor, CLAS-History, 20 years of service, spring semester

Title: Jim Crow's Red Children and the Rise of Tribal Self-Determination

Professor Rand will use a PDA to write two remaining chapters of a book on the 1971 rape and death of a Choctaw girl in the context of a historical analysis of the Mississippi Choctaw tribe's creation of a self-determinative government, and submit the manuscript to the UNC Press, Chapel Hill. The project initially aimed to discuss the history of violence against indigenous women and evolved into an interrogation of self-determinative governance reforms and impacts on indigenous women. Self-determination was not a stand-alone federal Indian policy that emerged in the 1970s. Influences like the West's post-war economic development programs for the developing world, US domestic programs, including the War on Poverty, War on Crime, and other social programs influenced the evolution of tribal leaders' self-determinative ideas and reforms through constitutional revisions and legal codes. By focusing on Choctaw women in conditions which shaped the granular texture of their lives, Prof. Rand shifts the focus from significant historically rooted causes such as the Major Crimes Act to the role of tribal governments as creators of programs and policies that impact women.

REISINGER, WILLIAM M, Professor, CLAS-Political Science, 33 years of service, spring semester

Title: Corruption and the Public's Support for their Leaders

Professor Reisinger will examine the complex relationship between the nature of corruption in a society and the public's support for their political leaders and institutions. Corruption has been perhaps the leading reason in recent years why citizens protest or rebel against their political leaders, in both democratic and autocratic countries. He will conduct statistical analyses of a unique dataset of nationally representative survey data gathered in 2015 and 2018 from China, Russia, Ukraine and Georgia. The outcome of the research will be articles in scholarly journals and a book from a university press. The proposed activities will enrich the knowledge he will bring to his undergraduate courses on authoritarian politics, and the politics of Russia and Eurasia, with new modules for both courses. It will also inform his graduate seminars on comparative politics. He plans to share his findings with local and statewide public forums. His findings will benefit policymakers in government and non-governmental organizations.

SAHA, PUNAM K, Professor, Electrical-Computer Engineering, 12 years of service, fall semester  
Title: Simplicial Topology and Geometry and their Applications to Quantitative Medical Imaging  
Professor Saha will study and research on theory and algorithms related to simplicial topology and geometry and recent advancements in similar topics. Prof. Saha has been an active researcher on theory and algorithms related to digital topology and geometry and their applications to medical imaging with specific emphasis on musculoskeletal and pulmonary imaging. He has developed several methods, which are widely used in bone micro-architectural and lung community, and recently, he has received a 5-year NIH RO1 grant award on CT-based modeling of bone micro-architecture and fracture-risk in chronic obstructive pulmonary disease (COPD). During the PDA, Prof. Saha will acquire comprehensive knowledge on simplicial topology and geometry, which will directly benefit his research and his graduate students in development of new methods and advancement of existing algorithms related to image segmentation and micro-architectural analysis. Prof. Saha is working on development of a graduate level course related to topology and geometry in image processing. The knowledge earned during this award will directly benefit the course design.

SAUDER, MICHAEL E, Professor, CLAS-Sociology, 13 years of service, half time for academic year

Title: Inequality and Luck

Although the idea of “luck” is a very common one in everyday discussions, we currently know little about how perceptions of luck vary across social groups or how these perceptions relate to views about life chances and success. Prof. Sauder will advance two projects to investigate how people view luck and its effects: a large-scale interview study of adults from different social backgrounds, and a comprehensive content analysis of historical references to luck in media from 1880 to the present. Both of these efforts will provide insight into who believes in luck, how perceptions of luck are tied to success, and to which areas of life—for example, relationships, health, jobs, sports, economic outcomes—people are most likely to apply luck. Prof. Sauder will conduct this research with the help of multiple graduate and undergraduate students and use it as a training tool in study design and methods. Prof. Sauder will also incorporate the findings and methodological innovations into his undergraduate courses. This research is tied to external funding applications, and it is expected to result in several research articles and, eventually, a book.

SCHIFF, ROBYN, Professor, CLAS-English, 10 years of service, half time for academic year

Title: Information Desk

Professor Schiff is composing "Information Desk," a book-length poem in the epic tradition that draws on her personal experience formerly working at the information desk at the Metropolitan Museum of Art, to contemplate art, commerce, and epistemology. Both a work of art history and a coming-of-age story, the poem is as concerned with the forces of power and history that drive the museum's encyclopedic collecting as it is with the social and psychosexual workplace dynamics of the museum itself at the turn of the 21st century. Prof. Schiff's stature as a poet richly contributes to the excellent writing tradition at Iowa, and her work is nationally known for how its emotional depth is propelled by intense formal ingenuity. The author of three critically acclaimed previous collections, Prof. Schiff's most recent book was released by Penguin, where she intends to place this manuscript. The New Yorker summarized Prof. Schiff's contribution to the field of contemporary poetry by stating that her attentive, unsettling poems “of almost forensic specificity.... offer something few poets ever discover: a vision of the whole world.” This project furthers hones her acute vision.

SCHLESINGER, LISA R, Associate Professor, CLAS-Theatre Arts, 4 years of service, fall semester

Title: The Iphigenia Project: Multidisciplinary Stories of Women Refugees

Professor Schlesinger will produce the world premiere of Iphigenia Point Blank: Story of the First Refugee, a film opera, part of The Iphigenia Project, in collaboration with international award-winning artists and theatre/film/media production companies In Parentheses and Lailou Productions in New York City for the 2019-20 theatre season and publish the play with NoPassport Press. She will create an online resource for archiving stories and testimonies of refugees with the UI Digital Scholarship and Publishing Studio for public engagement in theaters and for use in her General Education Diversity and Inclusion class and undergraduate and graduate playwriting classes. She will also research and write a new work, Ruinous Gods, the next full-length play in The Iphigenia Project. The Iphigenia Project is a multiyear interdisciplinary series of works, in collaboration with award-winning international artists, about the refugee crisis for national and international theatres, conferences, universities, and symposiums, and publications in the fields of theatre and social justice and performance studies.

SCHNELL, THOMAS, Professor, Industrial and Systems Engineering, 20 years of service, half time for academic year

Title: USAF Test Pilot School Human Systems Integration Curriculum

The U.S. Air Force Test Pilot School (TPS) is the premier entity in the world that trains military pilots in flight testing. The current curriculum at TPS focuses on traditional aspects of aircraft handling qualities. Modern military aircraft, however, have good (stable) flight characteristics, thanks to computer technology. The modern test pilot requires training in human-systems integration. The TPS wants to reinvent their curriculum by shifting focus from stick and rudder training to human-systems integration. This is the area of expertise of Prof. Schnell, who has built a world-renown flight test organization, the Operator Performance Laboratory (OPL) around this concept. TPS has invited him to get involved in modernizing their curriculum through tight academic collaboration which will include his development of classroom material at TPS, teaching to TPS students, establishing the connection of OPL and TPS aircraft and flight simulators as training aids, and the possibility of bringing TPS graduates to get PhD degrees in engineering at UI (with USAF funding). These graduates will then become advocates for UI engineering and OPL research programs with the government.

SHEA, CHRISTINE E, Associate Professor, CLAS-Spanish and Portuguese, 6 years of service, spring semester

Title: Social Sensitivity to Different Accents in Mexican Children

How and when do children become aware of different accents in their native language? How do children process different accents in their native language? For adults, recognizing that a speaker is from a different dialect region may lead to subtle (or not so subtle) social inferences, for children these inferences may not be available due to lack of experience and inability to attribute these differences to social groups. The question investigated in this study is how children perceive different accents and how they begin to recognize the social signals connected to them. Prof. Shea will spend her PDA (Spring 2020) at the University of Queretaro (UAQ, Mexico), affiliated with the linguistics department, where she will conduct studies with Mexican children between 4-6yrs of age. Professor Shea teaches classes on Spanish linguistics and focuses on language acquisition. This research will expand her expertise on Spanish language development and enrich her undergraduate teaching and graduate advising in Spanish linguistics. Iowa has a growing population of bilingual students and understanding their linguistic development is crucial to academic success and teacher professionalization.

SMOLIKOVE, SARIT, Associate Professor, CLAS-Biology, 9 years of service, fall semester

Title: Applying RNA-seq Techniques for the Study of DNA Damage Response in *C. elegans*

Professor Smolikove will utilize a PDA to learn and apply RNA sequencing and bioinformatic techniques to her research. Prof. Smolikove uses the *Caenorhabditis elegans* to study how the genetic material, called DNA, is inherited from generation to generation in a way that maintains its integrity. Her studies will identify genes that respond to DNA damage. Understanding how these DNA lesions are repaired requires the analysis of a product made from the DNA called RNA. RNA sequencing analysis expertise developed by Prof. Smolikove will allow her research group to perform accurate and reproducible gene expression analysis in a timely manner. The new data acquisition will be used for publications and preliminary results for grant proposals. The award will benefit teaching as the new expertise of Prof. Smolikove in the topic will be directly incorporated into her undergraduate classes. This technology will benefit the Iowa community by providing competitive skills to the lab. This work will enhance an active, extramurally funded research group, and provide employment opportunities to scientists and students in the Iowa workforce.

STERN, DAVID, Professor, CLAS-Philosophy, 29 years of service, half time for calendar year  
Title: Mapping the Origins and Structure of Ludwig Wittgenstein's *Tractatus Logico-Philosophicus* (1922): a bilingual digital humanities edition of the book and its relationship to its sources  
Professor Stern will work on a new translation of Ludwig Wittgenstein's *Tractatus*, one of a handful of key works of early analytic philosophy. He will also translate the manuscript sources of that book, including an early version, and three source notebooks. This will be the first unified translation of this group of texts, and the first English translation of some of them. As the current translations are outdated and inconsistent, this will be an important contribution in its own right. The new translations will also directly contribute to two other closely related research projects. First, Prof. Stern leads a team working on the University of Iowa *Tractatus Map*, an online tool that charts the genesis of *Tractatus*, comprehensively and clearly connecting the book with its manuscript sources, in both English and German. The new translations will be tailored to the needs of the Map project. Second, Prof. Stern is at work on a book-length genetic study of *Tractatus*, which will build on the results of this textual research. This work will enrich his courses on 20th century philosophy, philosophy of language, and Wittgenstein.

STERN, FREDERICK, Professor, Mechanical Engineering, 35 years of service, spring semester  
Title: Initiatives in Ship Hydrodynamics: Hydroelastic Wet Deck Slamming; and 3D Primary/Secondary Vortex Separation  
Professor Stern will conduct focused accelerated research to develop UI expertise in future Office of Naval Research (ONR) focus areas. This includes improved understanding of slamming loads/structural response, and smooth surface 3D vortex separation, which are grand challenges and critical limiting factors in ship design and operation. Achieving the objectives of multi-hull hydroelastic wet deck slamming wave basin experiments and collaborative fluid-structure-interaction simulations, and 6:1 prolate spheroid towing tank experiments and high-fidelity large eddy simulations will open new opportunities for Iowa ship hydrodynamics research. This is essential for continued ONR funding in the current highly competitive funded research environment. The proposed research contributes to teaching (undergraduate, M.S., Ph.D., and postdoctoral) and faculty development in new research initiatives, which requires an accelerated, greater than usual research effort in comparison with usual teaching, research, and service requirements.

TATE, ERIC, Associate Professor, CLAS-Geographical and Sustainability Sciences, 7 years of service, half time for academic year  
Title: Validating Social Vulnerability Indicators and Advancing Methodological Skills  
In the proposed PDA, Professor Tate will divide his time between Iowa City and as a visiting scholar at an interdisciplinary research center in Maryland. For the first project of the PDA, Prof. Tate will statistically analyze the relationship between flood disaster impacts and human

vulnerability. Given the flood proneness of Iowa, the results will contribute to understanding of local impacts, provide case studies and data for classroom teaching, expand theoretical understanding for future proposals and collaborations, and help generate advice for disaster managers. Dissemination of findings will occur through multiple journal manuscripts and conference presentations. For the second PDA project, Prof. Tate will develop new skills in software programming and qualitative data analysis. These skills will benefit graduate student advising and the ongoing Iowa Watershed Approach interdisciplinary project.

TINELLI, CESARE, Professor, CLAS-Computer Science, 19 years of service, fall semester  
Title: Theory and practice of Satisfiability Modulo Theories

Professor Tinelli will write a monograph on the theory and practice of Satisfiability Modulo Theories (SMT). SMT is subfield of automating reasoning that has found many successful applications and has had a transformative impact in several areas of computer science and beyond. Prof. Tinelli is an internationally renowned expert in this field. The monograph will be the first of its kind and satisfy a pressing need for a single source presenting the state of the art in automated reasoning. It will be useful as a main or a complementary textbook in courses at the University of Iowa and elsewhere on such topics as automated reasoning, logic in computer science, hardware/software verification, and constraint solving. In addition to presenting the theoretical foundations of the discipline, it will provide practical examples on how to leverage current SMT solvers to solve problems coming from a variety of fields. The expectation is that this will further popularize this powerful technology to the service of society.

TULLY, MELISSA, Associate Professor, CLAS-Journalism & Mass Communication, 7 years of service, fall semester

Title: Misinformation, Media Literacy, and Democracy in Kenya

Professor Tully will study the spread of misinformation on social media in Kenya and how to develop media literacy interventions to combat it. Although we know that misinformation circulates on social media, less is known about (1) who believes it and why, (2) what effects it has on democracy, and (3) how to stop it from misleading citizens around the world. News media literacy efforts are one way to address the spread of misinformation by equipping citizens with the knowledge, skills, and motivation they need to critically consume news. Kenya is an emerging democracy in the Global South and this project will provide much needed data on the problem of misinformation and the potential of media literacy interventions. This study will be based on a survey and interviews with Kenyan social media users and will result in peer-reviewed articles and will be the starting point for a book on misinformation and media literacy. Prof. Tully will also incorporate findings and insights from this project into her teaching in existing courses, including Social Media Today. Prof. Tully will also develop a new course on media literacy with a focus on global digital media.

VISPOEL, WALTER P, Professor, Education-Psych & Quant Foundations, 31 years of service, fall semester

Title: Extending Applications of Generalizability Theory to Inform and Improve Decisions Made from Assessment Tools

Cronbach and colleagues (1972) introduced “generalizability theory (G-theory)” as a framework to facilitate the design, evaluation, and modification of measurement procedures. However, since its inception, G-theory has seen limited use due to the esoteric language used to describe it, the unavailability of computer resources to do G-theory analyses, and the failure to integrate G-theory into contemporary measurement models. Professor Vispoel will complete a comprehensive review article that details ways to promote applications of G-theory and new methods of using it to obtain superior evidence of reliability and validity. The article will set the stage for development of a new textbook Prof. Vispoel will discuss with a potential publisher. The accessible information provided in the article and proposed book should be of benefit to anyone (employers,

administrators, teachers, students, parents, community members, etc.), who make decisions using information from objectively or subjectively scored assessment measures. Such decisions include, but are not limited to, screening, selection, placement, classification, certification, and diagnosis of strengths and weaknesses.

WADSWORTH, JOHN S, Associate Professor, Education-Rehabilitation & Counselor Ed, 18 years of service, fall semester

Title: Best Practices in Note-Taking in Therapeutic Relationships

Currently, there are no empirically based best practices or training methods in note-taking for counseling settings, yet most therapists take notes. Inaccurate notes by counselors have well documented deleterious impact on patient care, on reimbursement for services, and are a key evidentiary factor in malpractice cases. Prof. Wadsworth will validate a reliable note-taking strategy based on Counselor Complexity Theory and disseminate a theoretical, a best practices, and a training publication to state and national audience through three publications and additional presentations in 2019-2020. The dissemination of empirically based best practices will contribute to the University of Iowa's national reputation for leadership in patient care, has the potential to change the note taking practices of counselors, the method will likely become integrated into counselor training programs in Iowa and nationwide, and be of interest to forensic evaluation of failed therapy. While these outcomes are ambitious, they are realistic as there currently exist little research and guidance in this area.

WARREN, STEPHEN A, Associate Professor, CLAS-American Studies, 4 years of service, spring semester

Title: From Removal to Revival: Oklahoma Tribes and the Return of the Indigenous Midwest

Professor Warren will examine the causes and consequences of renewed interest in American Indians originally from Midwestern states such as Ohio, Indiana, Illinois, and Iowa between the 1920s and the 1970s. A century after the passage of the Indian Removal Act, historians and anthropologists, as well as businessmen and industrialists, became fascinated with the archaeological and historical record of indigenous people in their home states. These individuals established learned societies and began teaching and writing about American Indians from the Midwest. In the 1950s, the US Department of Justice and the Indian Claims Commission incorporated many of these individuals and the methodologies they promoted into Federal Indian policy. Native nations that once called the Midwest home received Midwestern ethnologists and, in many cases, returned to their Midwestern homelands for the first time in a century. From Removal to Revival will show how these collaborations simultaneously reinforced and threatened core components of Midwestern and Native American identities a century after Indian removal tore these populations apart.

XU, WEIYU, Associate Professor, Electrical-Computer Engineering, 7 years of service, spring semester

Title: Precise Analysis of Large-Scale Optimization Programs for Recovering Structured Data: a Unified Analytical Framework

This PDA proposal outlines a research and educational roadmap for developing a powerful and unified program of analytical frameworks to precisely analyze large-scale optimizations for recovering structured data; and for integrating research results into undergraduate and graduate education. There is an explosive growth of data generated from networked systems, including the Internet, the Internet of Things, social networks, and intelligent transportation systems. Optimization programs, especially convex programs, are critical approaches to recover structured data from indirect observations in signal processing, machine learning, and communications. There is a compelling need to precisely analyze the performance of these optimization programs. Professor Xu will try to establish a unified framework for precise analysis of these optimization programs. Prof. Xu will publish research results in top conferences and journals, and will

incorporate research results into undergraduate and graduate educations. This research will help design better and more efficient algorithms for big data analytics, facilitating Iowa's economy development.

ZHAO, KANG, Associate Professor, Business-Management Sciences, 6 years of service, half time for academic year

Title: Mining Online Social Networks and Social Media for Better Healthcare

The proposed PDA will leverage data mining and machine learning techniques to analyze data from online social networks and media for the purpose of enabling better healthcare for individuals. The ubiquity of online social networks and social media has changed the way we interact with each other. Many individuals have used such online platforms for health-related purposes. For the PDA, Professor Zhao will collaborate with researchers from China on two new research projects that mine online data to better understand and predict individuals' health-related behaviors offline. The first project focuses on analyzing how patients' online interactions with physicians are related to their offline hospital visits and satisfaction with physicians; the second project will develop a machine learning framework to detect individuals' offline health behaviors by examining their online behaviors. Prof. Zhao expects the PDA to produce cutting-edge knowledge for data science research, and inspire new practices in healthcare and business. It will also provide teaching examples and datasets for undergraduate, professional and graduate education.

ZIMMERMAN, DALE, Professor, CLAS-Statistics & Actuarial Science, 32 years of service, spring semester

Title: Linear Models for Spatial Data Using R

Professor Zimmerman will complete research for a book titled "Linear Models for Spatial Data Using R." The book will feature two main branches of spatial statistics known as geostatistics and areal data analysis. Data from these branches differ in terms of their spatial support (points versus areas), with the consequence that all relevant existing books and software packages present statistical methods for only one data type or for the two types separately. What will be novel about this book is its treatment of methods for both types of data together under the unifying framework of linear models, an area of statistics on which Prof. Zimmerman is one of the world's experts. Another unique feature of the book will be the extent to which it incorporates computer code from the R programming language; in fact, a new R package will be developed as a companion to the book. The book will serve as a text for the course STAT:6530 Environmental and Spatial Statistics that Prof. Zimmerman teaches. By summarizing and synthesizing knowledge and experience acquired by Prof. Zimmerman over his career, it will also benefit many statisticians and environmental scientists worldwide.

**UNIVERSITY OF NORTHERN IOWA**

Alstatt, Alison, Associate Professor, Music, 7 Years of Service, Fall and Spring Semesters  
Wilton Abbey in Procession: Religious Women's Music and Ritual in the Thirteenth-century Wilton Processional

This study will support interdisciplinary research on women in the Middle Ages whose lives are poorly documented and who have often been overlooked. The digital dimensions of the project extend the professor's findings to a general audience. The Wilton Processional is a medieval manuscript from Wilton Abbey, a Benedictine convent that educated English women for over 600 years. The manuscript, which contains music for processional rituals, was known only from a nineteenth-century copy until the researcher's recent identification of thirty-eight of its original leaves: primary sources of Wilton's ritual, musical, and literary life. The project consists of 1) the first book-length study of the manuscript; 2) a searchable digital inventory of the copy for the Cantus Database, and 3) an online digital facsimile of the leaves. This research is what qualifies Dr. Alstatt as an Associate Professor of Music History and informs her service to the Women's and Gender Studies Program at UNI. Furthermore, this project includes an original manuscript leaf from the University of Iowa Special Collections, and thus adds to the university's knowledge base. This project has also involved collaboration with researchers at the University of Oregon, the University of Iowa, and the University of Waterloo, Canada, where the professor's work is included in a Digital Humanities database. This work thus contributes to the international research profile of the University of Northern Iowa and the Regents system. Finally, this work benefits the people of Iowa by contributing to a more educated populace in the fields of History, Religion, and the Arts.

Brown, Seth, Professor, Psychology, 16 Years of Service, Spring Semester  
How Associate Stigma towards Depression Impacts Family Members

This PDA will be allotted between two primary activities: 1) Manuscript Formulation -Formulating and submitting two manuscripts to peer reviewed journals (based on a dataset collected prior to the start of this PDA), and 2) Conference Presentation-Presenting the preliminary findings in an expedient manner to other researchers and providers at a national conference. These activities will be based on data collected prior to the PDA period (October 2018 through December 2019). The occurrence and consequences of stigma (stereotypes, prejudice, and discrimination) towards individuals with mental illness is well documented and researched. However, the research on stigma towards family members of individuals with mental illness (associative stigma) is rather limited. Furthermore, the research on associative stigma predominantly focuses on family members who have relatives with schizophrenia, which neglects a sizeable population of family members who have relatives with more common mental disorders such as depression. The research stemming from this project would bring recognition to the University of Northern Iowa (UNI), facilitate collaborations with other researchers, attract undergraduate and graduate students to UNI, provide unique research and clinical opportunities for UNI students, and facilitate grant funding. Those family members who have a relative with depression (both in and outside Iowa) would benefit from this research perhaps through interventions developed later to address associative stigma. The dissemination of this material through class instruction would inform the general population (both in and outside Iowa) on associative stigma and lead to alterations in their behaviors.

Gute, Gary, G., Associate Professor, Applied Human Sciences, 17 Years of Service, Fall Semester  
Built to Flow: Ourselves, Our Families, Our Schools, Our Work

Built to Flow: Ourselves, Our Families, Our Schools, Our Work

With his mentor and collaborator Mihaly Csikszentmihalyi and colleague Deanne Gute, Dr. Gute is writing the book Built for Flow: Ourselves, Our Families, Our Schools, Our Work, Our Communities. In 1990, Csikszentmihalyi published the bestseller Flow: The Psychology of

Optimal Experience. Flow, that state of complete engagement in a challenging activity for its own sake, serves as a dominant theory within psychology, leisure, art, education, and leadership. Yet, 30 years after the publication of *Flow*, hundreds of scholarly investigations, flow is still not well understood. *Built for Flow* will clarify this limited and inaccurate understanding, serve as the only book to synthesize 50 years of flow research, and be the first to explain how the principles of flow can be applied to greatly improve both individual lives and systems: our families, schools, businesses, and communities. Since Dr. Gute's dissertation, much of his scholarship has investigated the important role of flow in our lives and the culture, but has been largely theoretical. This book advances Dr. Gute's work into the necessary arena of application. The co-author's book *Flow* has been translated into 23 languages, and many of his additional 18 books have been national and international best sellers. Upon that platform, *Built for Flow* will bring significant attention to the University on a large stage and Iowa will be featured prominently. As a civilization there is a desperate need to harness flow, direct our attention, and design a future that responds to pressing challenges of our time. The development of this book will help lead the way forward in this topical area.

Hesselink, Reinier, Professor, History, 23 Years of Service, Fall and Spring Semester  
The Suicide of Takenaka Uneme Book Project

In 2016, Dr. Hesselink published *The Dream of Christian Nagasaki: World Trade and the Clash of Cultures, 1560-1640* (McFarland Publishers, 298 pp). In it, he described Japan's rejection of Christianity from a world-historical perspective concentrating on the history of the founding of the city of Nagasaki. Dr. Hesselink is now engaged in a project on the same period, this time from the perspective of Japan's ruling class, i.e. the samurai under the leadership of the Tokugawa shoguns. Professor Hesselink proposes to approach this very different topic through the lens of the suicide of a samurai by the name of Takenaka Uneme (1588-1634). Uneme was employed by Shogun Tokugawa Hidetada (1579-1632) to mastermind the forced apostasy of all Nagasaki's 25,000 inhabitants from 1629 to 1632. The project does not exclusively aim to write the biography of this protagonist (although it will do that too), but rather to describe the warrior class of Japan as it was reorganizing itself during the reigns of the first three Tokugawa shoguns after the end of a civil war that had lasted for more than a century (1467-1600). For a state, like Iowa, that depends for much of its economy on Japan (most of its soybean crop and a large part of its corn harvest are exported to East Asia), it is of great importance to foster an awareness of Japanese culture and history. The citizens of Iowa deserve accessible history writing that explains the background of their trading partners and deals with problems directly relevant to their religious orientation.

Hettle, Wallace, Professor, History, 24 Years of Service, Fall Semester  
The Union Homefront: A History in Documents

Dr. Hettle proposes to create a primary source reader focused on civilians in the Union during the American Civil War. The historical literature on the Civil War has long been dominated by studies that focus on soldiers and politicians. There is much that is valuable in work on these traditional subjects: they offer dramatic triumph, societal tragedy, and lessons for public policy that remain relevant today. However, recent years have witnessed an outpouring of social and cultural history. Newer books on the Civil War era have focused on civilians, including studies of women's history, religious life, black abolitionists, and the cultural impact of mass death. Historians root their study of the past in primary sources, which includes anything written down, from diaries to death certificates. Collections of primary sources, typically edited, introduced and annotated, have long been invaluable as a classroom teaching tool. Today, we need a primary source reader building on new topics in the scholarly literature and reflecting the struggles of civilians on the Union Homefront. Writing such a book will enhance Dr. Hettle's teaching at UNI by allowing him to continue in the mutually beneficial roles of teacher and scholar. By aiming this work at both students and general readers, Dr. Hettle hopes to benefit Iowa's citizens by providing them a glimpse of ordinary people at a pivotal time in our shared history.

Kidd, Timothy, E., Professor, Physics, 13 Years of Service, Spring Semester  
Microscopic Origin of Electronic Growth Modes in Metal Dichalcogenide Systems

The main focus of research in this study will be to explore the interface formed when metals are deposited upon the surface of a class of materials known as the transition metal dichalcogenides. These materials are a rich source of research in both fundamental science and potential applied technologies related to rechargeable batteries, solar cells, and as the semiconducting analog to the profound nanoscale conductor graphene. Control over the growth of thin metallic films is one of the most important areas of small-scale electronic devices. As length scales are reduced to nanometers or even simply a few atoms, quantum mechanical influences begin to take over and defects and surface-related issues can dominate system properties. As metallic contacts are essential for literally every electronic device, achieving atomic level precision in growth is necessary to achieve the small scale required for packing literally billions of transistors on a single integrated circuit. One avenue for achieving such growth control is related to the properties of the electrons within the metal themselves. This route is of interest as it takes advantage of the very quantum nature of these subatomic particles which creates challenges when applying classical methods to such small length scales. In working with noble metals deposited upon the layered dichalcogenide semiconductor MoS<sub>2</sub>, researchers have discovered that electronic aspects appear to dominate growth. Furthermore, for the first time, electronic growth control has been achieved above room temperature. In other systems, these quantum interactions are so weak they cannot be seen except at cryogenic temperatures, meaning they would be far too expensive to integrate into any real-world device. These investigations are progressing into understanding how such control can be achieved at industry-applicable conditions as well as pursuing applied research into using our samples as prototype devices. It is expected that this work will result in a significant number of papers submitted to high quality physics, physical chemistry, and nanoscience journal involving undergraduate research assistants as co-authors.

Kogl, Alexandra, M., Associate Professor, Political Science, 15 Years of Service, Spring Semester  
Easier Than Saying No: Women, Domination, and Submission

This research is part of a book project that aims to further the development of a theory of power and gender. In the era of the MeToo movement, public discourse has begun to address the pervasiveness of sexual assault and harassment, but often relies on a language of guilt/innocence or predator/victim for making sense of these behaviors. Meanwhile, the development of academic theories of sexual domination has stalled in recent decades, as theorists have turned their focus toward more abstract and subtle forms of power. This research aims to move beyond the extremes of both simplistic public discourse and highly abstract academic theory by seeking to understand the power dynamics involved in sexual domination. It focuses not on acts of overt coercion, but instead on more ambiguous cases in which women submit to domination--cases in which a third party observer might be tempted to ask, "why didn't she just say no?" These more ambiguous cases, in which women seem to have the capacity to resist but do not, help us to shift our focus away from guilt and innocence, and toward the power dynamics in which men and women's lives are embedded. It aims ultimately to address the question, why do so many women continue to act in ways that seem complicit with their own oppression? Having already made significant headway on the literature review for the project, the specific research Dr. Kogl will complete while on PDA are phenomenological accounts of women's submission to domination.

Montgomery, Sarah, Associate Professor, Curriculum and Instruction, 10 Years of Service, Fall Semester  
Cultivating Well-Being Through Mindfulness in Higher Education

During the PDA, Dr. Montgomery will analyze data, write a book proposal, and complete initial chapters of a book about Mindfulness in higher education based on the findings from the study.

In Fall 2017, campus-wide survey data indicated that many university students are struggling with mental health. Given this data and the limited scholarship on Mindfulness initiatives in higher education, this qualitative research study focuses on a Mindfulness practice group that Dr. Montgomery will lead at UNI to support student well-being. Dr. Montgomery will meet with 25-30 UNI students every week for 30 minutes, teaching them Mindfulness practices such as breathing techniques, sitting practice/meditation, gratitude practice, arts-integrated experiences, and Mindful walking/eating. The study will explore students' perceptions of how Mindfulness can support them navigating challenges in higher education. Data sources include observations, student writing/drawings, photos, student responses to a pre-and post-reflection, and interviews. This project will positively impact the University of Northern Iowa and the citizens of Iowa, as it will directly address the mental health and well-being of UNI students. In addition, the project supports university-wide recruitment and retention goals by teaching students strategies and resources for how to navigate stress and challenges. Through teaching Mindfulness practices as a faculty member, the professor will be working to create a culture of care and to positively impact our campus culture. This PDA will support the writing of a book about a Mindfulness group that can impact the approach not only at UNI, but in higher education across the nation.

Poleksic, Aleksandar, Professor, Computer Science, 13 Years of Service, Fall Semester  
An Informatics Platform for Predicting Side-Effects Associated with Multi-Drug Therapies-  
Research and Commercialization

This project focuses on the development and commercialization of an informatics platform for predicting Adverse Drug Reactions (ADRs or "side-effects") arising from multi-drug therapies. ADRs represent one of the major health problems in the United States and are a significant burden on the US economy. Detecting ADRs during clinical trials is difficult due to limited study duration and small study population. An enormous number of potential drug combinations makes the discovery of polytherapy associated ADRs even more challenging. On the other hand, at any given time, one in four Americans is taking two or more prescription drugs, making the research on multi-therapy side-effects of key importance in drug discovery and public health. Dr. Poleksic will use the large number of patient safety reports, provided by the Federal Drug Administration, to compile statistics on population (such as gender or age) and treatment (such as drug-dosage or duration of treatment) specific ADRs. Subsequently, accurate statistical methods will be used to identify strong signals coming from therapy-ADR associations. Finally, the data collected in the first phase of the project will be used to develop more accurate Artificial Intelligence and Machine Learning methods for computational prediction of ADRs arising from high-order drug interactions. The long-term goal is to translate this research into practice by commercialization. Aside from economic benefits for the State of Iowa, successful commercialization of our platform will result in UNI-industry partnerships, positive publicity for the university, along with increased recruitment and retention of students and faculty at UNI.

Pramanik, Nilmani, Professor, Technology, 15 Years of Service, Fall Semester  
An Integrated Approach for Sustainable Manufacturing using Deviation-based Cost Formulations  
for Reducing Cost of Manufacturing and Optimizing Part Geometric Features

In today's global competitive market, sustainable manufacturing is a challenge, specifically for the small-and medium-sized enterprises (SMEs). In one sector (foundries) about 80% of them are SMEs with 50 or fewer employees. The Manufacturers need to produce at a minimum cost without compromising quality and at the same time maintain tight delivery schedule. In order to achieve these requirements, realistic modeling of cost of manufacturing is essential for estimating cost of a part/product. There are many factors that affect cost of manufacturing but the single most important parameter is tolerance (deviation from the nominal size). Previously, most of the cost formulations were developed based on some form of inverse power function of a single tolerance parameter. However, these single parameter cost representations pose serious limitations. One approach is to extend the tolerance from a single plus-minus size tolerance to geometric

tolerances (as per ASME Y14.5M standards) that could control relations between features of a part and other parts in an assembly -this essentially needs extension to three dimensions (3D). In earlier work, the researcher established generic cost formulations based on deviations of features of a part for assembly/mating relations between the parts. These deviation based cost formulations could be used to establish cost of manufacturing at various geometric tolerancing conditions. In this work, an integration of these deviation-based cost of manufacturing formulations with geometric feature optimization using an application programming interface (API), will be carried out. The procedure developed should enable the manufacturers to carry out realistic assessment of cost of manufacturing and could lead to sustainable manufacturing operations by reducing overall cost of manufacturing. This work would also open up possibility of developing research projects involving UNI graduate students in manufacturing areas.

Rosburg, Alicia, Associate Professor, Economics, 13 Years of Service, Fall Semester  
Sustainable Brewing: Perceptions and Practices

This project will contribute to the small but growing literature on the economics of brewing and will be the first study to evaluate brewers' perceptions and practices regarding sustainable brewing. The number of craft breweries in the United States has grown by approximately 325 percent over the last 10 years. The rapid expansion of the energy-intensive brewing industry, has led to national-and state-level initiatives to encourage sustainable brewing practices. Dr. Rosburg will use a survey of brewers to evaluate current brewing practices and the conditions and factors that might influence a brewer's decision to adopt sustainable practices. Within this analysis, Dr. Rosburg will explore the role of brewers' perceptions regarding demand for sustainably brewed beer as well as the role of brewers' peer social networks. The proposed research will directly benefit UNI students; Dr. Rosburg will incorporate results from the project into a forthcoming "Economics of Sustainability" course. The results of this research can also guide efforts by the Iowa Green Brewery Certification program launched by UNI's Iowa Waste Reduction Center (IWRC) in 2017. Collaboration on this research project with the IWRC will create a research partnership between academic economists and the IWRC that has the potential to raise the profile of not only the Iowa Green Brewery Certification program but the university as a whole. Other entities across the State of Iowa, including individual breweries and the Iowa Brewers Guild, would also benefit from a better understanding of brewers' perceptions and what factors influence brewer decisions to adopt sustainable practices.

Wonders, Brooke, J., Assistant Professor, Languages and Literatures, 5 Years of Service, Fall and Spring Semester

Purchase, Murder, Theft: A Story Collection

Economics is a field rife with obscurantism, even though economic concepts are explicable in layman's terms. Concepts like austerity, property, or even competition, take on a ritual power that assures their inevitability. Ordinary people then experience catastrophes like the Great Recession as something akin to weather—as a disaster or act of god(s). But god is formed in the imag(inary) of humans. Defamiliarization is literature's way of letting her readers perceive the world not as it is, but as it might be. What possibilities might a different set of myths allow? Speculative fiction often investigates structures of belief; unfortunately, it also tends to privilege dominant viewpoints. Where left critiques exist, they privilege race, gender, environmental degradation, and GLBTQ issues. Dr. Wonders would like to add a voice to those of speculative writers tackling issues of social class. She plans to complete a collection of short-stories operating in the fabulist tradition of authors like Nick Mamatas, China Mieville, and George Saunders. This collection, Purchase, Murder, Theft explores how free-market capitalism turns intimate relationships entropic and what it means to make art when economic logics fetter the artist's imagination. What sort of allegory does this historic moment require? Dr. Wonders will read from this collection at future Hearst Center Final Thursday readings for the citizens of Iowa and, as part of her work for the North American Review, will create a summer writing workshop in short fabulism for local Iowans.

**IOWA STATE UNIVERSITY**

ARENDR, SUSAN WOHLSDORF, Professor, Apparel, Events, and Hospitality Management, 13 years of service, fall semester

Professor Arendt will use her proposed assignment to write a foodservice management case study book and instructor manual, both of which will be available online at no cost for students and colleagues. Arendt will also develop course materials for her courses in foodservice systems management and support the progression of her graduate students in their Ph.D. studies.

BASAK, TATHAGATA, Associate Professor, Mathematics, 8 years of service, fall semester  
Professor Basak proposes an assignment to the Indian Statistical Institute in Kolkata to explore mathematical challenges such as sporadic simple groups and automorphic forms, develop new research collaboration, and set the groundwork for the next several years of scholarly work. Basak's findings will be disseminated in top journals and conference presentations, and enhance Iowa State's reputation in mathematics.

BASU, SAMIK, Professor, Computer Science, 15 years of service, fall semester  
Professor Basu will work with colleagues at Penn State and Cornell universities to use data mining and analysis to help lawmakers and medical professionals develop healthcare policies that are both effective and budget-conscious. This work will lead to more effective deployment of intervention strategies to manage disease outbreaks in both urban and rural areas, and result in external funding opportunities.

BECKETT, GULBAHAR, Professor, English, 4 years of service, full academic year  
Professor Beckett will use her proposed assignment to write a book, Project-Based Learning: A Timely and Necessary Paradigm Shift for Second Language/Foreign Studies, which will address the need for extended literature on the subject and inform curriculum design, implementation, and assessment, including technology integration. Beckett's work will also produce multiple publications and conference presentations.

BURKE, BRIANNA, Associate Professor, English/American Indian Studies, 7 years of service, spring semester  
Professor Burke's proposed assignment will support her auto-ethnography Indian Summer: Growing Up White in American Indian Cultures. The work explores her personal story, alongside those of others, to examine what it means to have grown up in the space between American and American Indian cultures and world views; and also supports her teaching in ISU creative writing, environmental literature and American Indian Studies.

CARAGEA, PETRUTA, Professor, Statistics, 15 years of service, fall semester  
Professor Caragea will use her assignment to concentrate on methods of analysis for large spatio-temporal data sets, and to establish the infrastructure necessary to initiate collaborations with scientists from major national laboratories in this area. The work will also provide additional recruitment and opportunities for graduate students, and result in publications, conference presentations and workshops.

CHANDRA, ABHIJIT, Professor, Mechanical Engineering, 19 years of service, spring semester  
Professor Chandra requests an assignment to focus on thermal instability in lithium-ion battery systems, which can lead to explosions and injury. Chandra will research ways to control the onset of stability, to extend battery life and avoid catastrophic explosions. The results will be shared with students and industry to improve battery safety, and lead to publications and external funding opportunities.

CHUNG, TELIN, Associate Professor, Apparel, Events, and Hospitality Management, 7 years of service, spring semester

Professor Chung proposes an assignment to study how big data can be used to better understand consumer behavior, predict trends and demands, identify customers, and provide a more personalized and seamless retail experience. The results will be incorporated into Chung's courses and teaching, contribute to publications and conference presentations, and support her department's Digital Merchandising Workgroup.

CORDERY, STACY, Professor, History, 2 years of service, full academic year

Professor Cordery will use her proposed assignment to work on her book, Elizabeth Arden and her Beauty Empire: Changing the Face of America. Arden literally changed the face of America by normalizing the use of cosmetics for women, while simultaneously transforming sales and marketing in the early 20th century. Cordery's work will examine the intersections of gender, class, race, immigration, and entrepreneurship, while also informing her teaching, including two new courses for Iowa State students.

CUNNALLY, JOHN, Professor, Art and Visual Culture, 29 years of service, full academic year

Professor Cunnally proposes an assignment to complete a third book in his specialty of antiquarianism during the Renaissance. Tentatively titled Amici Huberti, the book will shed light on the people who collected, interpreted, and exchanged ancient Greek and Roman coins during the 16th century, and provide value to undergraduate and graduate students studying art history and theory.

DIMITROVA, DANIELA, Professor, Greenlee School of Journalism and Communication, 15 years of service, full academic year

Professor Dimitrova will visit Austria and Turkey during her proposed assignment to study the framing of news reporting and social media related to the Syrian refugee crisis. The findings will result in several publications, conference presentations, and book chapters, and enhance the content for Dimitrova's Iowa State courses in international communication, mass communication theory, and political communication.

DOBSON, IAN, Professor, Electrical and Computer Engineering, 7 years of service, full academic year

Professor Dobson will identify key components in electrical power grids and other infrastructures that should be strengthened to mitigate not only against electrical blackouts themselves, but also their impact on other vital infrastructures such as water, transportation, and communications. The results will be used to develop new approaches that can be shared with students and colleagues, as well as publications, software, research projects and mathematical models.

FRANK, MATTHEW, Associate Professor, Industrial and Manufacturing Systems Engineering, 15 years of service, full academic year

Professor Frank, an expert in advanced manufacturing, will spend his proposed assignment at the Deere and Company technology center in Moline, IL. Frank will focus on advanced topics in reverse engineering and additive manufacturing; the results will be incorporated into his Iowa State courses, as well as lead to publications and external funding opportunities.

GANSEMER-TOPF, ANN, Associate Professor, School of Education, 11 years of service, spring semester

Professor Gansemer-Topf will address current challenges facing colleges and universities by investigating effective strategies for translating higher education research into policy in areas such as student learning, degree attainment, diversity and inclusion, and accountability. Outcomes of

this work will include publications and conference presentations, and the development of a graduate-level course on higher education policy.

GENSCHEL, ULRIKE, Associate Professor, Statistics, 13 years of service, full academic year  
Professor Genschel's proposed assignment will focus on developing statistical methods for complex data structures that are insensitive to data contamination and provide valid analysis even in the presence of outliers. Results from this work will include external funding proposals, new undergraduate coursework in statistics, and improved statistical tools for inter-departmental collaborations and consultations.

GENTILE, DOUGLAS, Professor, Psychology, 15 years of service, full academic year  
Professor Gentile requests an assignment to support his work with the Partnership for a Drug-Free Iowa, including the development of curricular modules for a digital media literacy program targeted to 5th-8th graders. Gentile will also use his time away from the classroom to retool his research program with a focus on positive psychology – including concepts such as resilience and happiness – and to write a book on the subject.

GEORGE, JOEY, Professor, Supply Chain and Information Systems, 7 years of service, spring semester  
Professor George will visit Australia and New Zealand during his proposed assignment to study how electronic health record systems can mitigate patients' deception of health care providers, which can lead to incomplete pictures of health, and in turn result in serious consequences like unnecessary medical procedures or prescribing inappropriate drugs. Outcomes of the assignment include the development and planning for two surveys for further George' research program.

GORDON, MARK, Distinguished Professor, Chemistry, 26 years of service, fall semester  
Distinguished Professor Gordon, one of the world's foremost authorities in high performance computational chemistry, will collaborate with leading developers of techniques and software in the U.S. and Australia to enhance the scientific community's ability to simulate heterogeneous catalysis on reasonable timescales – a grand challenge in the fields of chemistry and materials science. The results of his work will be shared in peer-reviewed papers and conference presentations.

HAAS, BARBARA, Associate Professor, English, 32 years of service, fall semester  
Professor Haas will use the proposed assignment to travel to Moscow and Crimea to work on her nonfiction project, *When We Tell Ourselves Stories about Russia these are the Stories We Tell*, which highlights the human drama that pulses beneath the diplomacy of U.S.-Russia relations. Haas' essays will be published in national literary journals, and be used to model international place-based writing for students in Iowa State's M.F.A. program.

HASSID, JONATHAN, Associate Professor, Political Science, 3.5 years of service, fall semester  
Professor Hassid's project will be among the first in the West to systematically examine the symbolic aspects of state power – how countries use apolitical speech like street signs, monuments, flags, heroes, sports teams, and even national time zones to build and expand their own legitimacy. The results will form the basis for a book on the subject, as well as multiple journal articles, and will be incorporated into Hassid's courses.

HILL, CHRISTINA GISH, Associate Professor, World Languages and Cultures, 9 years of service, spring semester  
Professor Hill proposes a project to use ethnographic and ethnohistorical methods to explore the importance of three sisters agriculture for Native peoples in the upper Midwest; the purposes and barriers to agricultural food security programs; and how Native people establish kin-based

relationships with non-human entities in the landscape to construct their own cultural and political autonomy. Results will include publications, a book manuscript, and a National Endowment for the Humanities fellowship proposal.

HOCHSTETLER, ANDREW, Professor, Sociology, 19 years of service, fall semester  
Rural communities face emerging challenges reflected in the opioid crisis. Professor Hochstetler will use his proposed assignment to examine how economic restructuring and social disorganization affect opioid hazards, develop tools to better predict at-risk areas, and then conduct research at 12 such areas. This work is supported by \$500,000 in external funding, with Iowa State as the lead institution (the University of Iowa is also a partner); results will be shared in criminology publications.

IVERSON, NEAL, Professor, Geological and Atmospheric Sciences, 21 years of service, full academic year  
Professor Iverson, an expert on glacial flow and landscape evolution, will use his proposed assignment to study how parts of fast-moving ice sheets move over their beds and deform along their sides. The results of this work will include new numerical models and techniques related to ice shear, two manuscripts, completion of a current National Science Foundation project, and submission of a \$400-\$500,000 external funding proposal.

KRIZAN, ZLATAN, Professor, Psychology, 11 years of service, spring semester  
Professor Krizan will study the impact of sleep among interrogation professionals in the criminal justice system during his proposed assignment, which includes visits to the University of Pittsburgh, and police departments in Tempe, AZ and Los Angeles. Results from this work will include a theoretical review paper, a first-of-its-kind applied research program on the subject, and external funding proposals.

LEE, DUCK-CHUL, Associate Professor, Kinesiology, 6 years of service, fall semester  
Professor Lee will analyze several large cohort databases to help determine what type or combination of exercise is most effective in preventing cardiovascular disease, the nation's leading cause of death. The results will contribute to more effective public health strategies, including scholarly abstracts and publications, and will be incorporated into Lee's human disease and epidemiology courses.

LEVITAS, VALERY, Distinguished Professor, Aerospace Engineering / Mechanical Engineering, 10 years of service, spring semester  
Distinguished Professor Levitas will perform research in the multidisciplinary area of phase transformation and plasticity during his proposed assignment. Levitas will also develop collaborations with the Interdisciplinary Centre for Advanced Materials Simulation in Germany and explore new research directions and funding opportunities. The results are expected to result in academic papers, and a pipeline to attract new graduate students and post docs.

LUCHT, TRACY, Associate Professor, Greenlee School of Journalism and Communication, 6 years of service, fall semester  
Professor Lucht, whose research focuses on the history, experiences, and contributions of women media professionals in the U.S., will use the proposed assignment to complete a biographical study of Iowan Amelia Bloomer, founder of The Lily – the first U.S. newspaper published specifically for women – and later president of the Iowa Woman Suffrage Society, to ensure Iowans understand her role in securing rights for women.

LUTZ, JACK, Professor, Computer Science, 31 years of service, spring semester

Professor Lutz will collaborate with computer scientists and mathematicians on various topics in theoretical computer science, including algorithmic randomness, algorithmic dimensions, and computational complexity. Lutz will also use the assignment as an opportunity to promote ISU computer science research, learn new ideas for molecular programming education, and explore new opportunities for research funding.

LUTZ, ROBYN, Professor, Computer Science, 20.5 years of service, spring semester

Professor Lutz's proposed assignment will extend her software engineering research into the growing field of programmed molecular nanosystems. These systems have a variety of applications, including medical sensors that can be absorbed by the body, drug capsules that open only when they find diseased cells, and programmable nanoscale robots. Lutz will visit with colleagues in California and Texas to develop safety-aware design techniques; the results will help prepare ISU students to lead in this new discipline.

MACKIEWICZ, JO, Professor, English, 4 years of service, fall semester

Professor Mackiewicz's project will explore how welding students develop embodied knowledge through one-on-one welding interactions and classroom time, and subsequently become members of a professional community of practice. The research will contribute to Iowa State's technical communications courses, extension and outreach to the agricultural community, and education in Iowa community colleges.

MARTENS, BOBBY, Associate Professor, Supply Chain and Information Systems, 12 years of service, fall semester

Professor Martens, an expert in trucking, proposes an assignment to conduct a joint research project on trucking market conditions – in particular the shortage of drivers, and electronic logs that limit drivers' hours of service – with colleagues at the Massachusetts Institute of Technology Transportation Center. Martens' work is expected to result in several publications that influence the local and national trucking industry.

MARTIN, RYAN, Professor, Mathematics, 15 years of service, full academic year

Professor Martin will increase the depth and breadth of his research in two areas – extremal theory of partially ordered sets, and extremal theory of graphs – during his proposed assignment. This work will increase the international visibility of Martin's research, as well as the reputation of the discrete mathematics group at Iowa State. Martin has applied for a Fulbright Fellowship to support his research collaborations in Hungary.

MCKINNEY, ELLEN, Associate Professor, Apparel, Events, and Hospitality Management, 6 years of service, spring semester

Professor McKinney will travel to Bunka Gauken, a prestigious Japanese university for fashion education, to study its model for innovation in textile design and marketing. The results of her work will be used in teaching apparel design and textile courses at Iowa State, and will also be shared with Iowa firms through collaborations with Iowa State University Extension and Outreach. McKinney has also applied for a Fulbright Fellowship to support her project.

MUENCH, JOSEPH, Professor, Art and Visual Culture, 17 years of service, spring semester

Professor Muench will use the proposed assignment to research, design, and build a body of sculpture, objects, and interpretive devices inspired by themes of nature, human activity, and artifacts found on ancestral farm sites located near Ames. The project will engage engineers, materials scientists, historians, and experts in the study of land, natural resources, and wildlife to add to the collective history of Iowa, and to enrich his scholarship and teaching.

NGUYEN, XUAN HIEN, Associate Professor, Mathematics, 7 years of service, spring semester  
Professor Nguyen focuses her research on the theoretical and computational challenges of partial differential equations, which are used extensively to model physical phenomena. The proposed assignment will allow Nguyen to expand this work to more general settings, reporting the results in scientific meetings and seminars, and helping inform computational modeling performed by her Iowa State colleagues.

NIEMI, JARAD, Associate Professor, Statistics, 7 years of service, full academic year  
Scientists have developed an astronomical number of computer models to simulate real world processes in the last 20 years. Professor Niemi will use his proposed assignment to develop more realistic emulators for the agricultural industry, including such topics as the soil-vegetation-atmosphere system, sediment runoff, and biogas production that model the input-output of current computer models and run in a fraction of the time. Results will include publications, grant proposals, and the statistical emulators themselves.

OAKES, GREGORY, Professor, Music and Theatre, 10 years of service, spring semester  
Professor Oakes will focus his assignment on designing and building a microtonal clarinet, an instrument custom-modified to play microtones – notes that fall between the pitches on a piano keyboard. Oakes will also commission prominent composers to write music for this new instrument that take advantage of its capabilities, and document performances for publication and exposure to the music community.

ONG, SAY KEE, Professor, Civil, Construction and Environmental Engineering, 24 years of service, spring semester  
Surface runoffs and wastewater discharges into Iowa rivers contribute to nutrient loads in the Mississippi River and Gulf of Mexico. Professor Ong's proposed assignment will focus on removal of nitrogen and phosphorus from wastewaters, a key component of the Iowa Nutrient Reduction Strategy, to minimize the impact on Iowa waterways. The results of this work will be shared broadly with students, faculty colleagues, and policymakers.

PETERSON, DAVID, Professor, Political Science, 9 years of service, full academic year  
Professor Peterson will use the proposed assignment to systematically test how campaign strategies are able to reach voters. As principal investigator on a National Science Foundation project, Peterson will analyze data collected during the 2018 campaign, refine research tools to be used during the 2020 Iowa Caucuses and general election, and draft multiple academic papers to enable more informed discourse on campaigns.

RINEY-KEHRBERG, PAMELA, Professor, History, 18 years of service, full academic year  
Professor Riney-Kehrberg will work on a book project, *When a Dream Dies: Agriculture, Identity, and the Farm Crisis of the 1980s*, during her proposed assignment. The book will make an immediate and substantial contribution to current debates about rural distress and the growing division between town and country, present implications for public policy, and be incorporated into her Iowa State history courses.

SEEGER, CHRISTOPHER, Professor, Landscape Architecture / Extension and Outreach, 21 years of service, January-June (6 months)  
Professor Seeger's assignment will build upon his expertise in geospatial and web mapping technologies, and data visualization, with new tools and techniques to expand the educational offerings of the ISU Extension and Outreach Geospatial Technology Program. His work is expected to result in new educational materials that provide hands-on learning to students to expand their technological and data science skills.

SHARMA, ANUJ, Associate Professor, Civil, Construction and Environmental Engineering, 4 years of service, full academic year

Autonomous vehicles, connected infrastructure, and distributed computing will transform the field of transportation operations management in the next 5-10 years. Professor Sharma will use the proposed assignment to receive specialized training and build industry connections in the areas of artificial intelligence, robotics, and distributed computing to integrate these concepts into his courses, pursue interdisciplinary collaborations, and pursue external funding.

SMITH, AMY ERICA, Associate Professor, Political Science, 6 years of service, full academic year

Professor Smith will examine the role of religion – specifically Christianity and Islam – in shaping attitudes and responses to the environment and climate change. Results of this work include two scholarly articles and a book manuscript, drawing on research and survey experiments in Brazil, Kenya, and the U.S. The work will also help environmental policymakers form more effective alliances with religious groups.

SMITH, EMILY, Professor, Chemistry, 12 years of service, full academic year

Professor Smith will use the proposed assignment to finalize the development of new technology for the collection of chemical data, which will span the fields of chemical, biological, biomedical, agricultural, and environmental sciences. Smith will also file an invention disclosure, establish a collaboration with the University of Wisconsin School of Medicine to use the technology, and work with funding agencies to support its final development and use.

SONG, JIMING, Professor, Electrical and Computer Engineering, 16 years of service, full academic year

Professor Song will expand his research in metamaterials, and establish new international collaborations, during his proposed assignment to visit China and Singapore. The results of his work are expected to result in new research collaborations, publications, enhanced visibility of Iowa State to international students and scholars, and will also be incorporated into Iowa State engineering courses.

VIATORI, MAXIMILIAN, Associate Professor, World Languages and Cultures, 13 years of service, fall semester

Professor Viatori will work on a book manuscript that examines how resource extraction, development, and pollution have transformed the relationship between human and non-human species in novel and unequal ways. The assignment, which will research physical environments and ocean ecologies in Peru, will position Viatori as a leading scholar in maritime anthropology and Peruvian studies and provide new material for his anthropology courses.

WANG, XINWEI, Professor, Mechanical Engineering, 10.5 years of service, spring semester

Professor Wang will travel to China to develop new capabilities in near-field thermal radiation during his proposed assignment. Wang's project will lead to collaborative international projects focused on rechargeable batteries, international student exchange and co-advising of Ph.D. students, and competitive external funding applications.

WITHERS, JEREMY, Assistant Professor, English, 7 years of service, fall semester

Professor Withers is a scholar of science fiction who focuses on representations of transportation within the genre. He will use the proposed assignment to complete *Futuristic Cars and Space Bicycles*, the first book to examine the history of representations of road transport machines in American science fiction from the late 19th to early 21st centuries. The book also highlights science fiction as a useful lens to view the struggle between cars and bicycles on our roads – how

society has arrived at many of its current transportation-related problems – and how solutions might be developed.

WOHL, SHARON, Assistant Professor, Architecture, 4 years of service, fall semester  
Professor Wohl, an expert in urban design, will pursue two research opportunities in the Netherlands to advance her work to provide an overview of complexity theory as it pertains to urbanism, including the development of a website that will assist students, professionals, and laypeople in understanding complexity principles. Wohl will also hone her teaching skills in this area, explore research opportunities and grant applications, and prepare multiple academic papers.

YOUNGS, CURTIS, Professor, Animal Science, 29 years of service, fall semester  
Professor Youngs will use his proposed assignment to write a book, Livestock Embryo Transfer: Science and Application, to address the challenge of global food security through the production of animal-source foods. The book will be used in Iowa State undergraduate courses on the subject, as well as provide updated information on embryo transfer for scientists, teachers, and students around the world.